ANNUAL ANNOUNCEMENT NUMBER

THE RUBBER AGE AND TIRE NEWS

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A French Motor Train Crossing the Alps

January 10th
1918

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PUBLISHED SEMI-MONTHLY
BY
THE GARDNER-MOFFAT CO., Inc.
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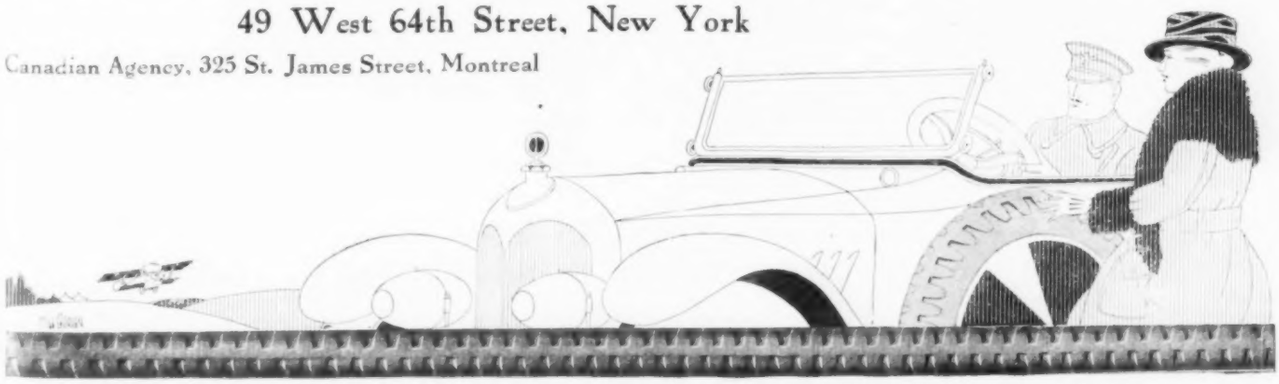

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Indexed Buyers' Guide to Rubber Products

Below will be found a list of Rubber Products and the index to the Rubber Companies who manufacture each item, compiled from information furnished by the manufacturers. The key symbols after the names of the articles refer to the names of manufacturers that appear in the Alphabetical List of Rubber Manufacturers that follows this BUYERS' GUIDE. Further information for Buyers will be gladly furnished by The Rubber Age and Tire News

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Hose, Coke, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, T6, U4, U10, V12, W42, C6, D38, M82, G22.

Hose, Compressed Air, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, M82, G22.

Hose, Conducting, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, M82, G22.

Hose Connections, A24, B42, B50, B52, C40, C64, E26, G50, M50, N28, Q4, R18, R20, S68, T6, U4, U10, C6, D38, M82, G22, A38.

Hose, Cotton, B50, C54, E26, G50, H8, M50, N28, Q4, R18, R20, S68, U4, U10, V12, W42, C6, D38, G22.

Hose Coverings, B42, B50, C40, E20, E26, G50, M50, N28, Q4, R18, R20, S68, U4, U10, V12, C6, D38, M82, G22.

Hose, Deck, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, T6, U4, U10, V12, W42, C6, D38, G22.

Hose, Discharge Agricultural, M52, U10.

Hose, Divers', B42, B50, C54, C64, E20, E26, G30, G50, H8, M50, N28, P20, R18, R20, S68, T6, U4, U10, V12, C6, D38, G22.

Hose, Dredging Sleeves, B42, B50, C40, C54, C64, E26, G30, G50, H8, M50, N28, P20, Q4, R18, R20, T6, U4, U10, V12, C6, D38, G22.

Hose, Dynamo Steam, B42, B50, C40, C54, E20, E26, H8, M50, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, C6, D38, G22.

Hose, Factory Fire, B42, B50, C40, C54, E26, G30, G50, H8, M50, N28, Q4, R18, R20, S68, U4, U10, V12, W42, C6, D38, G22.

Hose, Fire, B42, B50, C40, C54, E20, E26, G30, G50, H8, N28, Q4, R18, R20, S68, U4, U10, V12, W42, C6, D38, G22.

Hose, Fire, Cotton, Rubber Lined, B42, B50, C40, C54, E26, G30, G50, H8, N28, Q4, R18, R20, U4, U10, V12, W42, C6, D38, G22.

Hose, Fire Engine Suction, B42, B50, C40, C54, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, C6, D38, G22.

Hose, Fire Extinguisher Tubing, B42, B50, C40, C54, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U4, U10, V12, W42, C6, D38, G22.

Hose Fittings, A24, B42, B50, C40, E26, G50, H8, N28, R20, U10, V12, C6, D38, M82, G22.

Hose, Flue Cleaning, B42, B50, C40, C64, E20, E26, G30, G50, H8, M50, N28, P20, Q4, R18, R20, S68, T6, U4, U10, C6, D38, M82, G22.

Hose, Garden, B42, B50, C40, C54, C64, D40, E20, E26, G30, G50, H8, J10, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22.

Hose, Gas, B42, B50, C40, C54, C64, E20, E26, F22, G30, G50, H8, M50, M52, P20, Q4, R18, R20, T6, U4, U10, W42, C6, D38, M82, G22.

Hose, Gasoline, B42, B50, C40, C54, C64, D40, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22.

Hose, Gas Tubing, B42, B50, C40, C54, C64, E20, E26, F20, G30, G50, H8, M50, M52, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22, C18, A38.

Hose, Hard Rubber Suction, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, C6, D38, G22.

Hose, Hot Water, B42, B50, C40, C54, C64, D40, E20, E26, G30, G50, H8, J10, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, M82, G22.

Hose, Hydraulic, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, J10, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22.

Hose, Lathe Turret, M52.

Hose, Lawn, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22.

Hose, Linen, B50.

Hose, Mill and Factory, B42, B50, C40, C54, E20, E26, G30, G50, H8, N28, C6, D38, G22.

Hose, Molded, B42, B50, C40, C54, E20, E26, G30, G50, H8, J10, M50, N28, P20, Q4, R18, R20, U4, U10, W42, C6, D38, G22.

Hose, Oil, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68 T6, U4, U10, V12, W42, C6, D38, M82, G22.

Hose, Oil Suction, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22.

Hose, Paint, B42, B50, C40, C54, C64, E20, E26, G50, H8, M50, P20, R18, R20, T6, U4, U10, V12, C6, M82, G22.

Hose, Phosphate Suction, B42, B50, C40, C54, E20, E26, G50, H8, M50, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, C6, D38, G22.

Hose, Pneumatic, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, M82, G22.

Hose, Radiator Steam, U10.

Hose, Rubber, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, J10, M50, M52, M66, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, V42, C6, D38 M82, G22.

Hose, Sand Blast, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42 C6, D38, G22.

Hose, Sand Suction, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22.

Hose, Smooth Bore Suction, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42 C6, D38, G22.

Hose, Soda, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, C6, D38, G22.

Hose, Spray, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, C6, D38, M82, G22.

Hose, Steam, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, J10, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, M82, G22.

Hose, Steam Drill, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, M82, G22.

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Hose, Tanner, B42, B50, C40, C54, E20, E26, G50, H8, M50, P20, Q4, R18, R20, S68, T6, U4, U10, V12, C6, D38, G22.

Hose, Tender or Tank, B42, B50, C40, C54, E20, E26, G30, G50, H8, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, U12, V12, W42, C6, D38, M82 G22.

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Hose, Underwriters, B42, B50, C40, E20, E26, G30, G50, N28, Q4, R18, R20, S68, U4, U10, W42, C6, D38, G22.

Hose, Vacuum, B42, B50, C40, E20, E26, G30,, G50, H8, M50, M52, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, G22.

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Hose, Water, B42, B50, C40, C54, C64, E20, E26, G30, G50, H8, J10, M50, M52, N28, P20, Q4, R18, R20, S68, T6, U4, U10, V12, W42, C6, D38, M82, G22.

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Matting, Door, B42, B50, C40, C54, E26, E32, F20, F36, G50, H8, M50, M52, N28, P20, Q2, Q4, R18, R20, S68, U4, U10, V12, W42, C6, D38, G22, A38.

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Matting, Pyramid, B42, B50, C54, E26, F20, H8, M50, M52, N28, P20, Q2, Q4, R18, R20, S68, U4, U10. C6. D38, G22.

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Packing, Gaskets, B26, B42, B72, C14, C40, C54, E22, G30, G38, G50, J10, M50, M52, N28, P20, Q4, R18, R20, S68, U4, U10, V12, W42, C6, D38, W10, G22, C18, A38.

Packing, Oil Well, B26, B42, B72, C14, C40, C54, C64, E22, E26, G30, G38, G50, H8, J10, M50, M52, N28, P20, Q4, R18, R20, S50, S68, T6, U4, U10, V12, C6, D38, W10, G22.

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A 5—Achilles Rubber Co.
A 6—Acme Rubber Mfg. Co. See Advertisement on Page 298.
A 8—Acorn Insulated Wire Co.
A 10—Advance Rubber Co.
A 12—Aetna Rubber Co.
A 13—Aiken-Lambert Co.
A 14—Ajax Rubber Co., Inc.
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A 18—Akron Tire Co., Inc.
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A 22—Allcock Mfg. Co.
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A 28—Amazon Rubber Co.
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A 40—American Rubber & Tire Co.
A 42—American Rubber Co.
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A 46—American Rubber Mfg. Co.
A 48—American Rubber Mfg. Co. of N. J.
A 50—American Steam Packing Co.
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A 56—American Tire Co.
A 58—American Wringer Co.
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A 66—Archer Rubber Co.
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A 72—Asbestos & Rubber Works of America.
A 74—Asbestos & Rubber Works of New Jersey.
A 76—Asbestos Textile Co., Inc.
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A 86—Atlantic Mfg. Co.
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B 12—Baumann Rubber Co.
B 14—Bay State Insulated Wire & Cable Co.
B 16—Beacon Rubber Mfg. Co.
B 18—Beacon Falls Rubber Shoe Co.
B 20—Behrend & Rothschild.
B 22—Belden Mfg. Co.
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B 26—Belmont Packing & Rubber Co.
B 28—Berlin Rubber Mfg. Co.
B 30—BeSaw Tire & Rubber Co.
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B 36—Blake, Whitney Co.
B 38—Blakesley Novelty Co.
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B 40—Boonton Rubber Mfg. Co.
B 42—Boston Belting Co.
B 44—Boston Blacking Co.
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B 54—Bowers Rubber Works.
B 56—Bowling Green Rubber Co.
B 58—Braender Rubber & Tire Co. See Advertisement on Page 288.
B 60—Braintree Rubber Cement Co.
B 73—Brietson Mfg. Co.
B 62—British-American Mfg. Co.
B 64—Brock, A. S., Rubber Co.
B 66—Brooklyn Shield & Rubber Co.
B 68—Brunswick - Balke - Collender Co.
B 70—Bucyrus Rubber Co.
B 72—Buffalo Weaving & Belting Co.
C 2—C. C. C. Fire Hose Co.
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C 6—Canadian Consolidated Rubber Co., Ltd.
C 8—Canadian General Electric Co., Ltd.
C 10—Canadian Rubber Company of Montreal, Ltd.
C 12—Canadian Top Co., Ltd.
C 14—Cancos Mfg. Co.
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C 56—Community Rubber Co.
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C 70—Craig Dental Mfg. Co.
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C 76—Cummer-Dowswell, Ltd.
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C 80—Cupples Co.
C 82—Cutten & Foster.
D 2—Davidson Rubber Co.
D 4—Davis-Fry Mfg. Co.
D 6—Davol Rubber Co.
D 8—Day, H. P. & E., Inc.
D 10—Dayton Rubber Mfg. Co.
D 12—Dealers Steam Packing Co.
D 14—Deane Plaster Co.
D 16—Delion Tire & Rubber Co.
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E 2—Eagle Pencil Co.
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E 10—Eastern Rubber Co.
E 12—Easthampton Rubber Thread Co.
E 14—East Palestine Rubber Co.
E 16—Eclipse Cement & Blacking Co.
E 18—Ehman Tire & Rubber Co.
E 19—Electric Cable Co.
E 20—Electric Hose & Rubber Co.
E 22—Elkhart Rubber Works.
E 24—Ellis Cement Co.
E 26—Empire Rubber & Tire Co.
E 28—Endura Mfg. Co.
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E 32—Essex Rubber Co., Inc. See Advertisement on Page 299.
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E 42—Excello Raincoat Co.
F 2—Faber, A. W.
F 4—Faber, Eberhard, Rubber Co.
F 6—Fabric Fire Hose Co.
F 8—Fairfield Rubber Co.
F 10—Falls Rubber Co.

Alphabetical List of Rubber Manufacturers—Continued

F 12—Falls Novelty Co.
F 14—Faultless Rubber Co.
F 16—Featheredge Rubber Co.
F 18—Federal Asbestos Co.
F 20—Federal Rubber Co.
F 22—Firestone Tire & Rubber Co.
F 24—Fisk, Ltd.
F 26—Fisk Rubber Co. of New York.
F 28—Flexible Rubber Goods Co.
F 30—Ford Motor Co.
F 32—Foster Rubber Co.
F 34—Franche, C. E. Co.
F 36—Franklin Rubber Co.
G 2—G. & J. Tire Co.
G 4—Garlock Packing Co.
G 6—General Asbestos & Rubber Co.
G 8—General Electric Co.
G 10—General Tire & Rubber Co.
G 12—Giant Tire & Rubber Co.
G 14—Gibney Tire & Rubber Co.
G 16—Gillette Rubber Co.
G 18—Globe Rubber Co.
G 20—Globe Rubber Tire Mfg. Co.
G 22—Goodrich Rubber Co., The B. F.
G 24—Goodyear Rubber Co.
G 26—Goodyear Rubber Insulating Co.
G 28—Goodyear Tire & Rubber Co.
G 30—Goodyear Tire & Rubber Co. of Canada, Ltd.
G 32—Goodyear's India Rubber Glove Mfg. Co.
G 33—Goodyear's India Rubber Selling Co.
G 34—Goodyear's Metallic Rubber Shoe Co.
G 36—Gordon Tire & Rubber Co.
G 38—Gould Packing Co.
G 40—Granby Rubber Co., Ltd.
G 42—Great Eastern Rubber Co.
G 44—Greensburg Tire & Rubber Co.
G 46—Gregory Rubber Co.
G 48—Gryphon Tire & Rubber Co. See Advertisement on Page 286.
G 50—Gutta Percha & Rubber, Ltd.
G 52—Gutta Percha & Rubber Mfg. Co.
H 2—Habirshaw Electric Cable Co.
H 4—Hainsburg, N. H. & Co.
H 6—Hale, Alfred Rubber Co.
H 7—Halifax Rubber Co.
H 8—Hamilton Rubber Mfg. Co. See Advertisement on Page 297.
H 10—Hanover Rubber Co.
H 12—Hardman Tire & Rubber Co.
H 14—Hartford Rubber Works Co.
H 16—Hardright Co.
H 20—Hatch, Henry C.
H 22—Hauthaway & Sons, Inc.
H 24—Hawkeye Tire and Rubber Co.
H 26—Hazard Mfg. Co.
H 28—Hazen-Brown Co.
H 30—Heath, Edmund F. & Son.
H 32—Hendler, Jesse.
H 34—Hendrie, W. C. Rubber Co.
H 36—Hewitt Rubber Co.
H 40—Hodgman Rubber Co. See Advertisement on Page 297.
H 42—Hollingshead, R. M.
H 44—Holmes Packing & Supply Co.
H 46—Home Rubber Co.
H 48—Hood Rubber Co.
H 50—Hood Tire Co.
H 52—Hosmer, G. A. Co.
H 54—Howe-Baumann Balloon Co.
H 56—Howe Rubber Co.
H 58—Huntington Tire & Rubber Co.
H 60—Hygienic Rubber Works.
I 2—Ideal Rubber Co.
I 4—Imperial Belting Co.
I 6—Independent Rubber Co., Ltd.
I 8—India Rubber Co.
I 10—Indian Rubber Mfg. Co., Inc.
I 12—Indiana Rubber & Insulated Wire Co.
I 14—International Rubber Co.
I 16—International India Rubber Corp.
I 18—Invincible Tire Co.
J 2—Jackson-Eno Rubber Co.
J 4—Jenkins Rubber Co.
J 6—Johnson, Henry Co.
J 8—Johnson & Johnson.
J 10—Johns-Manville, H. W. Co.
J 12—Johns-Pratt Co.
K 2—Kansas City Rubber & Tire Co.
K 3—Kanzee Tire Co., Ltd.
K 4—Kaufman Rubber Co., Ltd.
K 6—Keasbey & Mattison Co.
K 8—Keaton Tire & Rubber Co.
K 10—Kelly-Springfield Tire Co.
K 11—Kendall Tire & Rubber Co.
K 12—Kenyon, C. Co.
K 14—Kerite Insulated Wire & Cable Co.
K 16—Keystone Rubber Mfg. Co., Inc.
K 18—Killion Rubber Co.
K 20—King Rubber Co.
K 22—Kleinert, I. B. Rubber Co.
K 24—Knight Tire & Rubber Co.
K 26—Kokomo Rubber Co.
K 28—Korber Rubber Mfg. Co.
L 2—L. & M. Rubber Co.
L 4—La Crosse Rubber Mills Co.
L 6—La Favorite Rubber Mfg. Co.
L 8—Lambertville Rubber Co.
L 9—Longwear Rubber Co.
L 10—Lancaster Tire & Rubber Co.
L 12—Laurel Company.
L 14—Lee Tire & Rubber Co.
L 16—Lion Tire & Rubber Corp.
L 18—Lincoln Rubber Co.
L 19—Longwear Rubber Co.
L 20—Lovell Mfg. Co.
L 22—Lowell Insulated Wire Co.
L 24—Lubron Co.
L 26—Luzerene Rubber Co.
L 28—Lycoming Rubber Co.
L 30—Lynn Rubber Mfg. Co
M 2—McClurg Rubber Co.
M 4—McCormick, E. J. Rubber Co.
M 6—McCreary Tire & Rubber Co.
M 8—McCue & Pierce.
M 10—McGraw Tire & Rubber Co.
M 12—McIlroy Belting & Hose Co.
M 14—McLean Tire & Rubber Co.
M 16—McNaull Tire Co.
M 18—McTernen Rubber Mfg. Co.
M 20—Maguire Rubber Co.
M 22—Manhattan Rubber Mfg. Co.
M 24—Manheim Mfg. & Belting Co.
M 26—Mansfield Tire & Rubber Co. See Advertisement on Page 287.
M 28—Maple Leaf Rubber Co.
M 30—Marathon Tire & Rubber Co.
M 32—Marathon Tire & Rubber Co., Ltd.
M 34—Marion Insulated Wire & Rubber Co.
M 36—Marion Tire & Rubber Co.
M 38—Mason Tire & Rubber Co.
M 40—Massillon Rubber Co.
M 42—Mattson Rubber Co.
M 44—Mayflower Rubber Works Co.
M 46—Meade Rubber Co.
M 48—Mechanical Fabric Co.
M 50—Mechanical Rubber Co. (Chicago).
M 52—Mechanical Rubber Co. (Cleveland).
M 54—Mercer Rubber Co.
M 56—Merchants' Rubber Co.
M 58—Metal Hose & Tubing Co.
M 62—Meyer Rubber Co.
M 64—Michelin Tire Co.
M 65—Midland Tire & Rubber Co.
M 66—Miller Rubber Co.
M 68—Miner Rubber Co., Ltd.
M 70—Minzensheimer, Dr. Her.
M 72—Mishawaka Woolen Mfg. Co.
M 74—Mohawk Rubber Co. See Advertisement on Page 296.
M 76—Montgomery Bros., Inc.
M 76—Moore, Alfred F.
M 80—Morgan & Wright.
M 82—Mulconroy Company, Inc.
M 84—Mutty, L. J. Co.
M 86—Mutual Tire & Rubber Co.
M 88—Mystic Rubber Corp.
N 2—Narragansett Rubber Co.
N 4—National Aseptic Laboratories.
N 6—National Co.
N 8—National India Rubber Co.
N 10—National Rubber & Specialties Co.
N 12—National Rubber Co.
N 14—National Rubber Mfg. Co.
N 16—National Tire & Rubber Co.
N 18—Needham Tire & Rubber Co.
N 20—Newark Rubber Co.
N 22—New Brunswick Rubber Co.
N 24—New Castle Rubber Co.
N 26—New England Cable Co.
N 28—New Jersey Car Spring & Rubber Co.
N 30—New Jersey Rubber Supply Co.
N 32—New York Belting & Packing Co.
N 34—New York Insulated Wire Co.
N 36—New York Mackintosh Co.
N 38—New York Rubber Co.
N 40—New York Shield Co.
N 42—Northern Electric Co., Ltd.
N 44—Northland Rubber Co., Inc.
N 46—Norwalk Tire & Rubber Co.
O 1—Oak Rubber Co.
O 2—O. K. Tire Co.
O 4—Okonite Co.
O 6—Olden Rubber Mfg. Co.
O 7—Old Town Rubber Co.
O 8—Oliver Rubber Mfg. Co.
O 12—Omo Mfg. Co.
O 13—O'Neil Tire and Rubber Co.
O 14—Oriental Rubber Co.
P 2—Packard Electric Co.
P 4—Panther Rubber Mfg. Co.
P 6—Parker Pen Co.
P 8—Parker, Stearns & Co.
P 10—Partridge, F. E. Rubber Co.
P 12—Pearce-Arrow Tire & Rubber Co.
P 14—Pearce Tire & Rubber Co.
P 16—Peerless Cement Co.
P 18—Peerless Insulated Wire & Cable Co.
P 20—Peerless Rubber Mfg. Co.
P 22—Peerless Tire & Rubber Co.
P 24—Pennsylvania Rubber Co.
P 26—Perfection Tire & Rubber Co.
P 28—Perfection Tube Co.
P 30—Peters Mfg. Co.
P 32—Pharis Tire & Rubber Co.
P 34—Phillips, Eugene F., Electrical Works, Ltd.
P 36—Phillips Insulated Wire Co.
P 38—Phoenix Hermetic Co.
P 40—Pike Rubber Co.
P 42—Pines Rubber Co., Inc.
P 44—Plymouth Rubber Co.
P 46—Polack Tyre & Rubber Co.
P 48—Portage Rubber Co. See Advertisement on Page 300.
P 50—Porter Rubber Co.
P 52—Portland Rubber Mills
P 54—Prenzel, A. H., Rubber Co.
P 56—Progress Rubber Co.
P 58—Progressive Rubber Co.
P 60—Puget Sound Rubber Co.
Q 2—Quabaug Rubber Co.
Q 4—Quaker City Rubber Co.
Q 6—Quality Tire & Rubber Co.
Q 8—Quinn, K. J., & Co.
R 2—Racine Auto Tire Co.
R 4—Racine Rubber Co.
R 6—Rainbow Rubber Co.
R 8—Raley Rubber Co.
R 10—Raymond & Co.
R 12—Reach, A. J., Co.
R 14—Reading Rubber Mfg. Co.
R 16—Reality Rubber Co.
R 18—Republic Rubber Co.
R 20—Revere Rubber Co.
R 22—Roberts Rubber Co., Weldon.
R 24—Roebling's, John A., Sons Co.
R 26—Rome Wire Co.
R 28—Rosenthal & Katz.
R 30—Rosenwald & Weil.
R 32—Royal Equipment Co.
R 34—Royal Rubber Cement Co.
R 36—Royal Rubber Works.
R 38—Rubber & Celluloid Harness Trimming Co.
R 40—Rubber Goods Mfg. Co.
R 42—Rubber Insulated Metals Corp.
R 44—Rubber Products Co.
R 46—Rubberset Co.
R 48—Rubber Step Mfg. Co.
R 50—Rubber Stopple Co.
R 52—Ryan Ideal Stain Blacking Co.
S 2—Safety Insulated Wire & Cable Co.
S 4—Salem Rubber Cement Co.
S 6—Salem Rubber Co.
S 7—Samson Tire & Rubber Co.
S 8—Savage Tire Corp.
S 10—Savoie Rubber Co.
S 12—Schacht Rubber Mfg. Co.
S 14—Schavoir Rubber Co.
S 16—Schaw Cone Tire Co.
S 18—Schein, S., & Sons.
S 20—Schmid-Lyon Rubber Co.
S 22—Schwarzwaelder Co.
S 23—Sciato Rubber Co.
S 24—Seabury & Johnson.
S 26—Seamless Rubber Co. See Advertisement on Page 297.
S 28—Semple Rubber Co.
S 30—Simplex Wire & Cable Co.
S 32—Smith Canvas Tread Tire Co.
S 34—Soltau, Robert, Co.
S 36—Southern Tire & Rubber Co.
S 37—Savoie Rubber Co.
S 38—Spalding, A. G., & Bros.
S 40—St. Louis Rubber Cement Co.
S 42—St. Mungo Mfg. Co. of America.
S 44—Standard Four Tire Co.
S 46—Standard Rubber & Cable Co.
S 48—Standard Tire & Rubber Co.
S 50—Standard Tire & Rubber Mfg. Co.
S 52—Standard Underground Cable Co.
S 54—Standard Woven Fabric Co.
S 56—Star Rubber Co.
S 58—Steece, Mortimer.
S 60—Sterling Rubber Co., Ltd.
S 61—Sterling Tire Corp.
S 62—Stokes, Joseph, Rubber Co.
S 64—Stoughton Rubber Co.
S 66—Stowe & Woodward Co.
S 68—Strong Rubber & Asbestos Mfg. Co.
S 70—Sun Novelty Co.
S 72—Sunset Rubber & Supply Co.
S 74—Sussex Rubber Co.
S 76—Swinehart Tire & Rubber Co.
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T 10—Toronto Rubber Co., Ltd.
T 12—Transparent Rubber Co.
T 14—Traun Rubber Co.
T 16—Tyer Rubber Co.
U 2—U-Glu Supply Corp.
U 4—United & Globe Rubber Mfg. Co.
U 6—United Shoe Machinery Co.
U 8—United States Asbestos Co.
U 10—United States Rubber Co. See Advertisement on Page 284.
U 12—United States Tire Co
V 2—Vail Rubber Co.
V 4—Van Cleef Bros.
V 6—Victor Balata & Textile Belting Co.
V 8—Victor Rubber Co.
V 10—Viscol Company.
V 12—Voorhees Rubber Mfg. Co. See Advertisement on Page 343.
V 14—Vulcalose Co.
V 16—Vulcan Asbestos Mfg. Co., Inc.
V 18—Vulcan Proofing Co. See Advertisement on Page 356.
V 20—Vulcan Rubber Co.
V 22—Vulcanized Products Co.
V 24—Vulcanized Rubber Co.
W 2—Waitt Cement Co.
W 4—Wales Goodyear Rubber Shoe Co.
W 6—Washburn & Moen Mfg. Co.
W 8—Waterman, L. E., Co.
W10—West American Rubber Co.
W12—Western Electric Co., Inc.
W14—Western Reserve Rubber Co.
W16—Western Rubber Co.
W18—Westinghouse Electric & Mfg. Co.
W20—Whitall-Tatum Co.
W22—White, S. S., Dental Mfg. Co.
W24—Whitehead Bros. Rubber Co.
W26—Williams-Bowman Rubber Co.
W28—Wilson Tire & Rubber Co.
W30—Wire & Cable Co.
W32—Wohlberg, Richard.
W34—Woodward, F. E., & Sons.
W36—Woodworth Mfg. Co.
W38—Woonsocket Rubber Co.
W40—Worthington Ball Co.
W42—Woven Steel Hose & Rubber Co.
X 2—Xenia Rubber Mfg. Co.
Y 2—Yatman Rubber Co.
Z 2—Zee Zee Rubber Co.

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Unequalled Service, Superior Facilities, Attractive Quality

THE RUBBER AGE AND TIRE NEWS

JANUARY 10, 1918 VOL. II. NO. 8

Member of the Associated Business Papers, Inc.

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THE GARDNER-MOFFAT COMPANY, Inc., *Publishers*

120 WEST 32D STREET NEW YORK

Room 308-310 Evening Star Building, Washington D. C.

SUBSCRIPTION PRICE: ONE DOLLAR PER YEAR. SINGLE COPIES TEN CENTS. CANADA: TWO DOLLARS A YEAR. FOREIGN: THREE DOLLARS A YEAR. COPYRIGHT, 1918, BY THE GARDNER - MOFFAT COMPANY, INC., PUBLISHERS.

ISSUED ON THE TENTH AND TWENTY-FIFTH OF EACH MONTH. FORMS CLOSE FIVE DAYS PREVIOUSLY. ENTERED AS SECOND-CLASS MATTER MARCH 26, 1917, AT THE POST OFFICE AT NEW YORK, N. Y., UNDER THE ACT OF MARCH 3, 1879.

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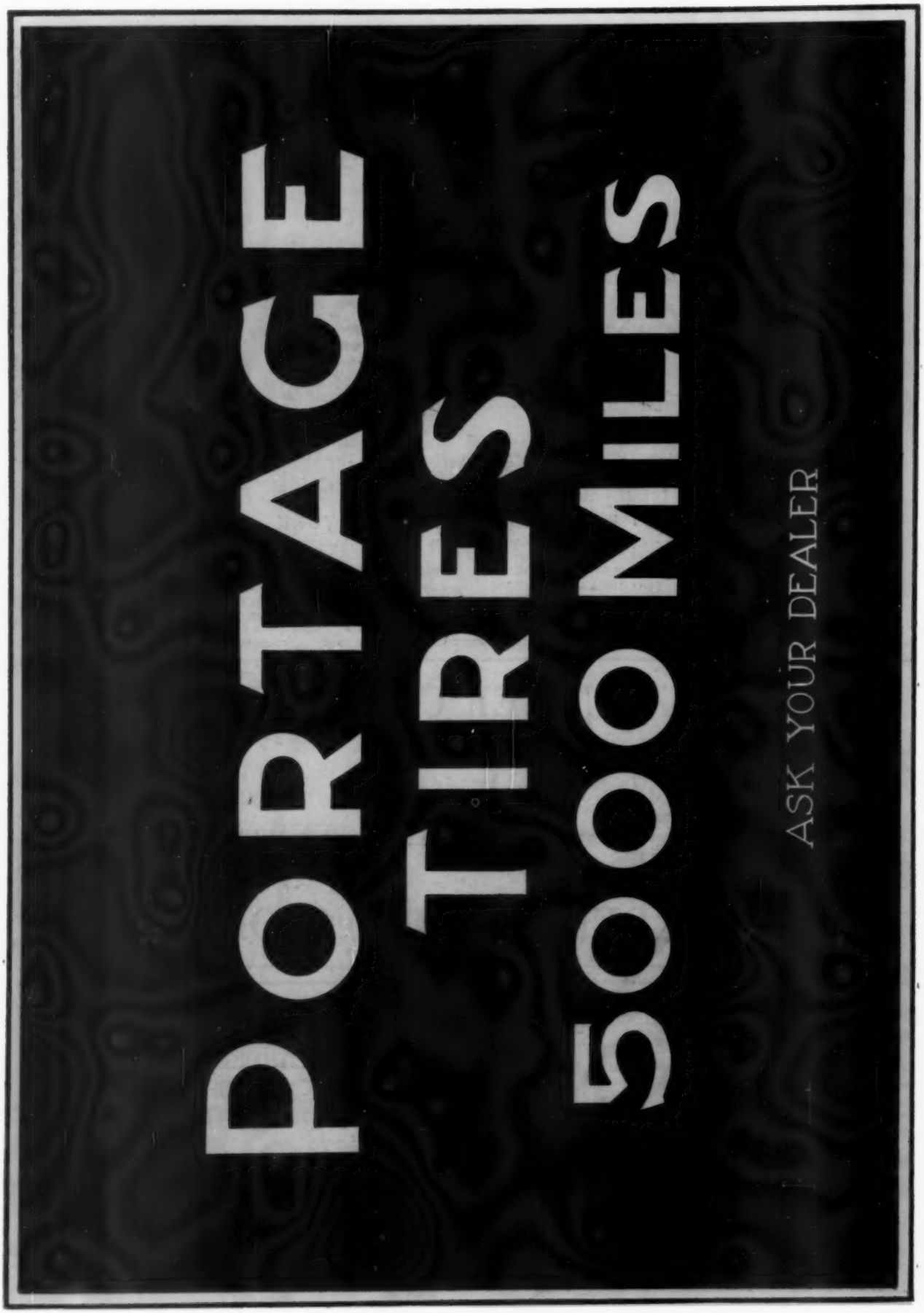
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THE
RUBBER AGE
AND TIRE NEWS

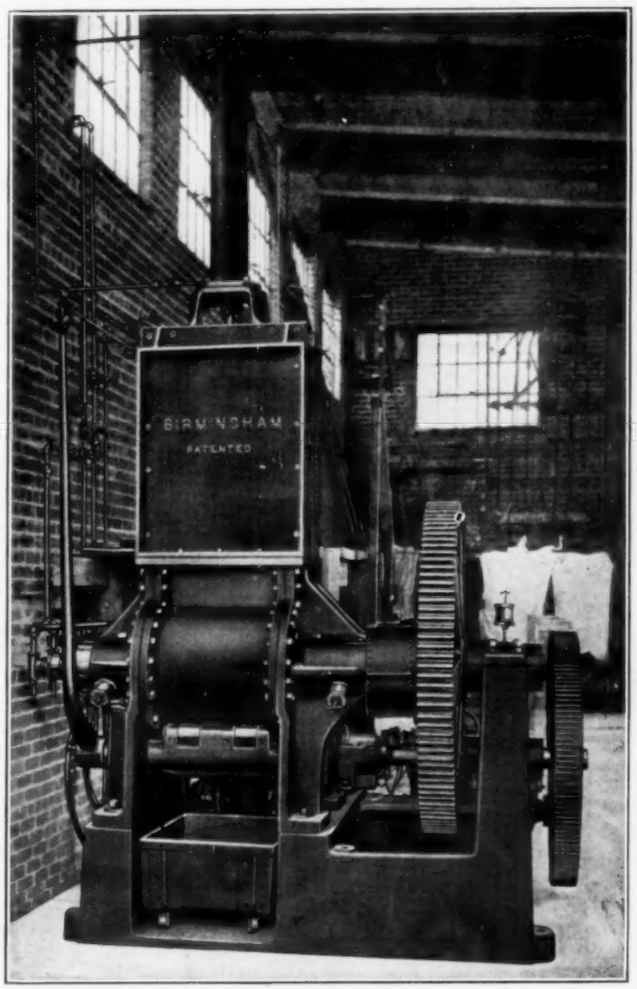
A Successful Automatic Rubber Mixer

In the early days of the rubber industry it was the practice to cut crude rubber into small pieces and mix it with a solvent before placing it in the mixing machine, which at that time was a modification of the "pug mill" used in crockery works and in brick yards for working earth and clay into a plastic mass.

Later on, mills with wooden rolls, held in frames of wood, were used for incorporating into rubber the various ingredients used in its manufacture. These wooden mills were followed by iron ones, provided with iron rolls. A solvent was still used to soften the rubber and facilitate mixing.

Later it was discovered that the heat generated by traction and friction between the rolls helped "break down" the rubber, and this led to the development of mills, the rolls of which were chambered for regulating their temperature. This latter type of mixing mill or grinder is still in general use today. Many improvements have been made in the details of its construction, but the principle of the machine and its operation have remained the same for more than half a century.

Properly operated, the rubber grinder does very satisfactory work, but the human element plays a large part in the matter and it is an uncertain quantity which is constantly causing trouble and loss to rubber manufacturers. The millman has to become accustomed to his mill and the stock he is mixing, and then still, much depends upon his skill or disposition and his individual factor.



BANBURY AUTOMATIC RUBBER MIXING MACHINE

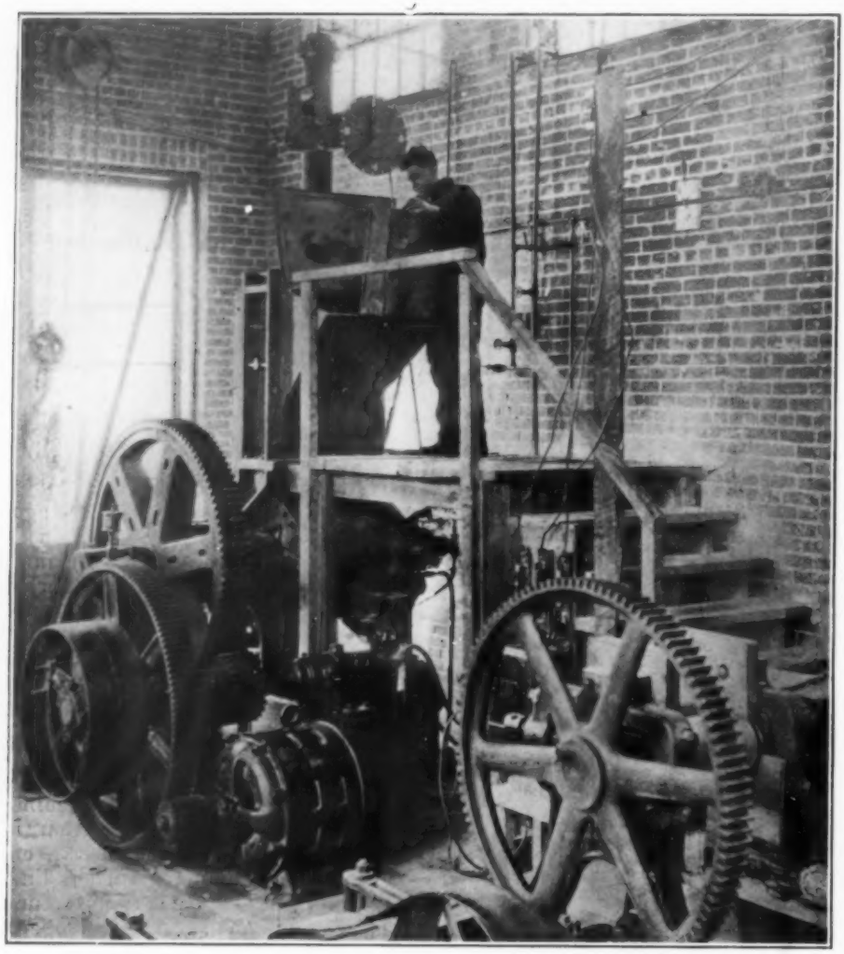
Many efforts have been made in this country and abroad to eliminate the troublesome factor of human element, but until recently these attempts were not marked with commercial success.

A little more than a year ago, Farnley H. Banbury, sales engineer and works manager of the Birmingham Iron Foundry, Derby, Conn., brought out a rubber mixing machine which appears to be filling the long felt want for something to reduce the mixing of rubber to a positively automatic operation. Several scores of Banbury automatic mixing machines are now in operation in American factories engaged in the various lines of rubber manufacture, some have been in operation for the past twelve months, and it is reported that they are giving satisfaction. This machine no longer can be considered as an experiment.

The Banbury automatic rubber mixing machine is designed to "break down" the rubber and incorporate into it the various compounding materials. In other words it is designed to do the same work as heretofore has been performed on two-roll mixing mills of the common sizes: 40-inch, 60-inch and 84-inch. It does this work automatically, without any "cutting back" or "sweeping up," or in fact any hand work in which the human element is a factor.

Description

This automatic mixer consists, essentially, of an enclosed trough in which operate mixing arms or blades; a hopper is arranged on top and through it the rubber and powders are fed into the mixing trough in the bottom of which is a discharge door operated by air



LOADING A BANBURY MIXING MACHINE

pressure. The feed hopper is provided with a dust-tight cover, so that the whole is a tightly enclosed machine.

The whole design has been worked out with thorough understanding of the heavy duty work to be performed in mixing rubber. Cut gears are used throughout and the connecting gears between the mixing arms run in a slush pan which insures ample and positive lubrication at all times.

Temperature

The walls of the mixing trough and the blades are chambered for heating and cooling purposes, and a thermometer bulb is inserted through the wall of the machine to enable the operator to read the temperature of the rubber being mixed, instead of having to guess at it as is necessary where the ordinary mixing mill is used.

Some of the rubber manufacturers now using Banbury machines have equipped them with temperature regulators, high and low temperature alarms and recording thermometers to make the machines more automatic and keep records of the work done by operators. The high and low temperature alarms make it an easy matter for the operator to do other work while the machine is mixing stock. These alarms call the operator's attention by ringing a bell and showing a red light.

Timing Device

Banbury mixing machines have a timing device as part of their regular equipment. This device is attached to the upper part of the machine and has a dial arranged at a convenient level for the operator's eyes.

An indicator hand operates on the face of this dial, where it is mounted on a friction geared direct to the machine. After loading the machine, the operator puts this hand back to zero and sets his alarm at the required number of minutes so that a bell is sounded when the batch should be unloaded. This permits the operator to do other work and prevents his forgetting to unload the machine when the batch is mixed.

Operation

In operating the machine, the operator feeds the rubber and compounding materials through a hopper into the mixing trough, where it is held under the pressure of a ram. After this the operator need not touch the machine again during the mixing process.

Frequently, the rubber and the compounding materials can be fed into the machine together, but when this is not practicable, the "fillers" and other ingredients can be fed into the mixer after the rubber has been "broken down," and in any desired sequence.

When the batch is thoroughly mixed, the discharge door is opened and the machine unloaded and made ready for another batch in a fraction of a minute. The discharge door is operated by air pressure, and is provided with a strong and positive lock.

The several rubber manufacturers who have been using the machines for many months have found their output to be uniform. When the cooling water is properly adjusted, the machine always produces, not only the same quantity, but also the same quality of work in a given time. The mixing is entirely independent of the exertion of the operator whose work is limited to feeding and discharging the machine.

This mechanical mixer has demonstrated the fact that it "breaks down" and mixes rubber as thoroughly as can be done on grinder rolls, and usually in about two-thirds the time required by the latter to do the same amount of work. It breaks down the stock to any desired degree of softness, and a great deal of saving can be effected by its use.

It will be readily seen that this mixing machine is very much safer for the operator than the grinders now in general use, because of the fact that all its working parts are entirely enclosed.

From the standpoint of the operator's health, the Banbury machine has decided advantages over the machinery now in general use, for the machine is entirely enclosed, and no dust or vapors can escape from it. This feature is particularly of interest now that liquid accelerators are coming into wide use and may cause serious damage to the health of operators, especially in small plants, where there may be carelessness in handling these chemicals.

Another feature of this new machine is the fact that it can be operated by unskilled operators and does not require the attendance of a strong, husky man as does a mixing mill.

Capacity and Output

The size of the batches that can be mixed in the Banbury machines now in use vary from 75 to 175 pounds, depending upon the specific gravity

of the mix. The output of compounded stock per diem depends, of course, upon the variations in stocks and the purpose for which they are used.

The stock is discharged from the mixer in lump form and an economical method of installation is to have the mixing machine located above a sheeting mill, into which the stock can be fed direct to be sheeted and batched. The stock can also be sent directly from the mixer to the refiner.

Drive

These mixers may be driven from the mill shaft line, in the same manner as the standard roll mixer, or by individual motor. The individual drive is, of course, preferable and most manufacturers have installed their Banburys in this manner.

For the individually driven machine, a 75-horsepower motor has been found best, although 50-horsepower motors are now successfully operating mixers in several factories, where comparatively soft stocks are mixed. The machine arranged for drive from a line shaft below the floor level occupies a space measuring eight feet by six feet.

Arranged for individual motor drive it occupies a little more space, approximately ten feet and a half by six feet. With the group drive from line shaft arrangement, three or four times as much stock can be mixed per square foot of factory floor space as with standard roll grinders; with the individual motor drive arrangement, the floor space economy is not so great, but is still very considerable.

Discharge Truck

In keeping with the designer's aim to perfect every detail connected with the machine and its operation in rubber factories, a standard discharge truck or "buggy" has been provided. This vehicle is of sturdy construction, is mounted on four swivel wheels, and is of correct size and shape so that the mixing machine can discharge its load into it without waste or loss of time. The mixed stock can thus be transported from one operation to another with a minimum of labor.

The Depolymerization and Oxidation of Raw Rubber

(*Continued from the last issue*)

III.—The Viscosity Restoring Itself After Plasticating

In some factories the plasticated and mixed rubber is stored for some time before vulcanization, the explanation sometimes given for this being that the rubber recovers itself. For this reason it is of importance to describe here the investigation made by Van Heurn as to the possibility of restoring the viscosity of plasticated rubber. Thus the viscosity number of a sample of Congo rubber was measured immediately after it had left the rolls and again a fortnight later. In the first instance it amounted to 11.6, in the second to 11.9. This shows little change, although there is a small increment. In order now to tackle the question more fully, the same test was made for different Hevea rubbers.

Samples of Hevea crepe, Hevea sheet and Hevea smoked sheet were plasticated on the hot rolls. Immediately after cooling, about 3 grm. of each sample was shaken in brown bottles with 100 grm. of benzine, till the rubber was entirely dissolved. After filtering through glass-wool, solutions of different concentrations were made of the filtrate in order to measure the relative viscosities at 30 deg. C. The viscosity number of each of the three plasticated samples could then be calculated.

The results are laid down in Table VI.

The viscosity number denotes here the area enclosed by the viscosity curve, the ordinate of the 3 per cent solution and both axes. Should the ordinate of the 1 per cent solution be chosen, as is customary with viscosity measurements of unplasticated rubbers, then the differences do not sufficiently appear.

The samples were now stored for 20 days, and after this period solutions were once again made of about 3 grms. rubber in 100 grms. benzine. Viscosity measurements yielded the results laid down in Table VII.

These figures show beyond any doubt that the viscosity number of all three has decreased, in other words that the rubber has partly restored itself.

It should, however, be pointed out that these increments are not so considerable as one is inclined to assume at first sight, because these viscosity numbers are much greater than those one obtains when the ordinate of the 1 per cent solution is taken as the limit of the area which has to be measured. And, further, that one should not conclude that such storing is favorable for the properties of rubber articles, whereby one must bear in mind that the mixes are usually plasticated afresh after storing. The latter manipulation has a very unfavorable influence. In evidence thereof some figures are given below in Table VIII from tests by Dekker.

Diverse samples were mixed with 7½ per cent sulphur on slightly heated rolls and then divided into two parts, of which one was immediately put ten times through the rolls, and the other part also, but only the following day. After this the relative viscosity of a 5 per cent benzine solution was measured.

Table VI

Viscosity of Three Rubbers Immediately After Plasticating

	Hevea-crêpe			Hevea-sheet			Hevea smoked sheet		
Relative Viscosity	37.4	9.0	4.53	48.5	10.8	5.0	47.7	9.86	4.0
at the concentration	3.33%	1.66%	1.04%	3.33%	1.70%	1.02%	3.40%	1.66%	0.87%
Viscosity number		145			179			170	

Table VII

Viscosity Numbers of the Three Rubbers from Table VI 20 Days after Plasticating

	Hevea-crêpe			Hevea-sheet			Hevea smoked sheet		
Relative Viscosity	37.7	8.0	3.87	55.9	9.74	3.80	53.6	12.0	4.20
at the concentration of	3.33%	1.54%	0.89%	3.36%	1.52%	0.78%	3.37%	1.73%	0.86%
Viscosity number		157			207			191	

Table VIII.

Influence of the Viscosity of Cooling and again Rolling of Plasticated Rubber-Sulphur Mixes.

	Relative Viscosity 1st. half. 5 % solution	Reactive Viscosity 5% solution after 1 night. 2nd half
Sheet No. 71	404	200
Crepe No. 7	177	80
Crepe No. 23	325	232
Crepe No. 54	124	138
Sheet	192	169
Crepe No. 27	192	169

To this can be added that this unfavorable influence is also noticeable after vulcanization on the mechanical properties, vide Part VI.

This proves that storing with the object of plasticating a second time is injurious. On the basis of these experiments it may, however, not be concluded whether there is any advantage in storing unvulcanized articles already shaped.

IV.—The Oxidation of Rubber

Many investigators, such as Gorter,[9] Peachy,[10] Kirchhof,[11] and Kerbosch,[12] have studied the oxidation of rubber. Van Rossem's[13] work has already been alluded to, and his conclusion was that the *oxidation of rubber is a secondary process,* which can only take place when the rubber has been previously depolymerized to a definite critical viscosity, is not in disagreement with the experiments of the above-mentioned. On the contrary, it is perfectly compatible with their conception. This, for instance, was Gorter's experience when studying the oxidation of an African rubber, having inclination to become tacky, and which had deposited itself as a thin film in a flask after the evaporation of a 2 per cent benzine solution. Oxidation only started after six days in an oxygen atmosphere in diffuse daylight. Apparently during that time such a depolymerization had taken place in consequence of the daylight that only then oxidation could make a start.

Peachy observed that rubber, having lost its resin through extraction with acetone, was much sooner inclined to oxidize than non-deresinized rubber. He concluded from this that the resin was of influence on the velocity of oxidation, but overlooked that the deresination during extraction with acetone for ten hours must have materially assisted the depolymerization.

Kerbosch's investigations showed that rubbers having been prepared by evaporation, exhibit a much slower velocity of oxidation than those which have been obtained by the usual method of coagulation with acetic acid. From this he was led to conclude that the presence of soluble substances of the latex decreases the oxidizability considerably.

These observations of Kerbosch are apparently in disagreement with those made by the Institute, according to which heated rubber will become oxidized sooner than the non-heated article. One must, however, bear in mind that its experiments have only referred to the *moment* when the oxidation is started, whereas those of Kerbosch deal with the *velocity* of oxidation. A new investigation taking this difference into account would certainly be advisable. Little proof is also afforded by his other experiments, in which non-oxidizing rubber, prepared by evaporation, was extracted by water in order to remove the serum compounds, and then dried at 105 deg. C., after which he found that oxidation took place very rapidly. Here he overlooked the depolymerizing action of the heating process. This test is precisely a confirmation of the conclusions mentioned above.

Different investigators embrace the idea that the absorption of oxygen is an auto-oxidation process in which peroxides of the carbon hydrate play the role of oxygen carriers according to the theory of Engler-Weisberg.[14] Kirchholf made use of this theory to explain the formation of the oxidation products $C_{10}H_{16}O$ and $C_{10}H_{16}O_2$ both found by Herbst.[15]

Other chemists, however, find other oxidation products. In general, the separation and identification of these compounds is rather complicated and troublesome. This presence of peroxides on oxidation of rubber has been established at the Institute.

Finally, allusion should be made to observations by Fol,[16] who found that on heating rubbers for a few hours at 100 deg. C., no oxidation takes place.

V.—The Influence of Copper Salts

Many investigators testify that copper salts have an extremely injurious influence on rubber and cause it to become tacky in a short time. Copper salts may occur in rubber:

1. Through coagulation with acetic acid containing copper.
2. By using copper washing rolls and other copper utensils on the plantation.

Clayton Beadle and Stevens[17] estimated that 0.01 to 0.02 per cent copper in the acetic acid used for the coagulation, was already ample to produce tackiness permanently. Eaton[18] was even able to show that a rubber sheet, having been immersed for 1 minute in a 1 per cent solution of copper sulphate and then washed for 2 hours became perceptibly tacky.

Tests made at the Institute confirmed the bad influence of copper salts, contrasting to the action of other metallic salts. In connection with this an investigation was carried out as to the copper percentage of the acetic acid of two factories in Holland. The percentage was extremely small, injurious influence being excluded in these cases.[19]

A closer investigation is needed to settle whether the process of depolymerization or the oxidation is accelerated by copper salts. The Institute considers that it is likely that the depolymerization is influenced.

In any case the advice must be given, to mind accurately and continuously the purity of the acetic acid for the coagulation.

[9] *Mededeelingen over rubber,* No. II (Depart. v. Landb., Nijverh. en Handel in Ned. Indië 1912).
[10] *India-Rubber Journal,* 45 (1913), 361.
[11] *Kolloid-Zeitschr,* 13 (1913), 49.
[12] *Mededeelingen over rubber,* No. III (Depart. v. Landb., Nijverh. en Handel in Ned. Indië 1915).
[13] *The Rubber Industry* (London, 1914), p. 149.
[14] *Kritische Studien zur Autoxydation,* 1904.
[15] *Ber. d. deutsch. Chem. Ges.* 39 (1906), 523.
[16] *Rubber-Recueil* (Batavia, 1914), p. 437.
[17] In a Report to the Rubber Growers' Association in 1913.
[18] *Bull. No.* 17, *Dep. of Agriculture,* Federated Malay States, 1912.
[19] A Report on this was rendered to the International Association for Rubber Cultivation in the Netherland Indies in 1914.

Information Exchange

Want Palmer Web Fabric

Inquiry from H. N. W., California.—We are in the market for a Palmer Web Fabric coated (spread) with a No. 1 compound (rubber and sulphur, with perhaps a little litharge). This fabric is to be used for special cord tire construction and we want it of medium grade cotton, that is to say that it does not have to be better than Peelers. Kindly put us in touch with textile manufacturers to quote us on this fabric, which must be light in weight but thoroughly impregnated and coated with rubber.

Want Rubber Heels for Export

Inquiry from M. G. B., New York.—We do a large export business and have an important foreign outlet for rubber heels. Will you kindly put us in touch with American manufacturers of the same.

Wants to Make a Cord Tire

Inquiry from H. E. S., Nebraska.—We would like to be put in touch with someone who has a good cord tire we could manufacture in the West.

Want Rubber Goggles

Inquiry from E. J. S., Washington.—We do a large business in rubber goggles and the factory that has been supplying my needs has discontinued making this line of goods. We would appreciate if you could give us the names and addresses of manufacturers of rubber automobile and dust goggles.

Wants Tire Factory Plans and Equipment

Inquiry from the H. Co., New York.— Kindly put us in touch with engineering concerns that could supply us with complete plans and specifications for the construction and equipment of a large tire factory we are about to establish.

Tire Reliners, Boots and Shoes

Inquiry from D. T. T. C., Indiana.—Kindly supply us with the names and addresses of manufacturers of reliners, boots and shoes for automobile tires. We do a big business in new tires and also in tire repairing and can use quantities of the supplies above mentioned.

The Manufacture of Rubber Soles and Heels

By C. S. Redfield

Second Installment

Making Sole Blanks

The manner of making sole blanks is as follows: the large rolls of stock, on a truck, are backed up to a zinc covered table about 30 ft. in length. The lifting type of truck is used and the roll is left on the truck at the end of the table. The wrapper or liner is then started and the roll is unrolled and a sheet of stock laid out flat on top of the table. The wrapper is removed from the top of the stock and the sheet is cut across near the roll. The stock is then folded over, beginning at the far end. About 4 ft. is folded over and is then folded on itself again, giving four folds about 1 ft. wide. The stock is then cut off and the operation repeated until finally the whole roll is consumed. The lengths of the folds in the stock should be about 2½ in. longer than the longest die to be cut with, or approximately the width of the block on the beam dinker. The folded sheets are then placed on the block of the beam dinker and the die run across by hand. In folding stock in this manner several blanks are cut at once.

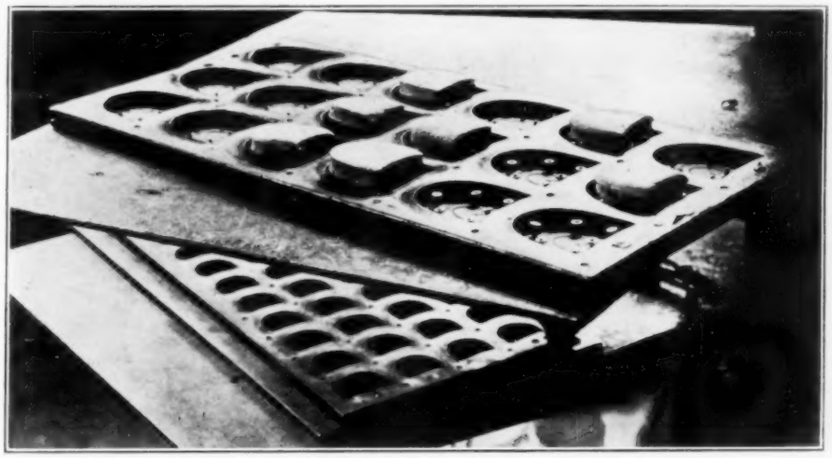
Behind the beam dinker should be placed scrap boxes, as in the heel operation. These are best made of metal and men should be made to place scrap in them and not on the floor.

Sole Mold and Blanks

Curing or Vulcanizing

In rubber sole and heel work the vulcanizing is the most important operation outside of the compounding of the rubber itself.

Briefly stated, the curing operation consists of placing a blank of stock in a metal mold and pressing it with hydraulic pressure, so that the mold is completely filled with stock. Steam, under pressure, is passed through the plates of the press while the hydraulic pressure is on. The mold is heated up by conduction, and some radiation. The stock in the mold takes up the heat and by combination of sulphur with the rubber it becomes vulcanized.



Heel Molds Showing Blanks and Washers in Place

The Presses

The presses are of two kinds, hand and hydraulic. The hand-press is seldom used in sole and heel work. The hydraulic press in most general use is of the four or five "deck" variety, with plates 42 x 42 in. Such a press should turn out at least 1,000 pairs of soles per day. This, of course, depends somewhat on the vulcanizing time, but as a general rule this capacity should be attained. The hydraulic pressure should be from 1,800 to 2,200 lb. per sq. in. The rams of the presses should be kept well greased and free acting, but free from leaks, as a small leak in the high pressure hydraulic line, or in the gasket around the cam, has a marked effect on the hydraulic pressure. The plates of the press, which are hollow, are heated with live steam. The steam admission valve being opened a little wider than the exhaust valve, pressure is created in the plates. The greater the difference of these openings, the greater the pressure in the plates, and the higher the vulcanizing temperature.

The Hydraulic System

The hydraulic system of a press-room is usually divided into two parts, one system running at about 2,000 lb. per sq. in. pressure and the other system running at around 175 lb. per sq. in. pressure. The last named system is known as the auxiliary system. Its purpose is to raise the cams of the hydraulic pressure before the high pressure is turned on. Thus, the operation of starting a cure consists of opening the auxiliary pressure valve until the molds and plates are as near together as they can be, i. e., the ram is in the raised position. After this the high pressure is turned on and the auxiliary closed at the same time. Finally, at the end of the vulcanizing time, the high pressure valve is closed, the ram drops and the press opens. Although it takes a little more time to raise the rams with the auxiliary pressure than with the high pressure, the cost of the loss of this amount of time, is more than made up by the difference in cost of maintaining the pressure at 175 lb. per sq. in. and at 2,000 lb. per sq. in.

The auxiliary pressure is usually maintained with a double acting hydraulic pump. This pumps direct,

running faster or slower as required. For maintaining the high pressure the hydraulic pump pumps against an accumulator. The accumulator consists of a very heavy weight, usually large iron plates, mounted on a ram. It is the duty of this hydraulic pump, acting on the accumulator ram, to keep the accumulator from the zero position, thus maintaining high pressure. It is evident that the work the pump is compelled to do depends upon the number of hydraulic valves open on the presses at one time.

Four-Platen Hydraulic Press

The best arrangement is to have the high pressure hydraulic pump driven by an electric motor. On the side of the accumulator are placed two contacts, one at the high position and one near the low position. As the accumulator reaches the high position and touches the upper contact it throws a rheostat, which shuts off the current, and the motor and pump stop. As the accumulator nears the low position and touches the lower contact, the rheostat is thrown around which closes the contracts on a panel board and starts the motor, thus maintaining the high hydraulic pressure automatically.

Molds and Mold Handling

Sole molds are made separately, i. e., a mold for each size and each foot. They are made in one piece with a plug hole in the shank for an interchangeable plug.

The spring-heel sole seems to be a thing of the past. The demand is for men's ¼ in. forepart with thin shank and heel. A rubber heel is then attached. The term " iron " is used in connection with rubber soles. One " iron " is 1-48 of 1 in., thus a 12 " iron " sole is ¼ in. thick. When molds are made up for this method, the demand is for 10 " iron " forepart with thin shank and heel. For women, the demand is for soles with 3-16 in. forepart with thin heel and shank on which a regular rubber heel can be attached by the shoemaker.

The cost on sole molds is a very varying quantity. In the case of a new style, two wooden patterns must be made for the casting of each size mold. The cost of each pair of patterns would be in the vicinity of $6. For casting and finishing a pair of sole molds the cost would be in the vicinity of $6.

Heel molds are made up in two kinds, two plate and three plate. They are usually of the three-plate variety, with interchangeable plate. The number of cavities varies from twelve to twenty-four, depending on the sizes. The bottom plate carries the pins, the number of pins depending on the size of the heel. The type of pin used is made with a shoulder, the washer being placed on the shoulders of the pins before the stock is placed in the mold. The cost of heel molds is also a very varying factor. The following figures give some idea of the cost:

Women's.—Half heel, 21 cavity, $21; whole heel, 12 cavity, $34.

Men's.—Half heel, 12 cavity, $24; whole heel, 12 cavity, $36.

These prices include pins for washers, but not for lettering.

Mold Handling

Heel molds, since there are numerous cavities in one mold, can usually be handled as a whole; thus, eight to twelve molds form a heat. Two sets of molds are used so that while one set is in the press the other is being filled with heel blanks. The operation consists of placing the heel washers on the shouldered pins; a heel blank is then placed in each cavity and the top plate placed in its proper position. The same operation is performed on the other mold until enough have been loaded to fill the press. After the loaded molds are placed on the various plates of the press the auxiliary pressure is turned on. The ram should rise very slowly and care must be taken that the pins in the plates of the molds come together properly, as otherwise the mold is sure to be broken. After it is ascertained that the mold pins are correctly in position, and the ram is up as far as the auxiliary pressure can take it, the high pressure is turned on and the auxiliary shut off. The molds are allowed to stay in the press the length of cure. They are then removed and those which were being filled while the previous cure was in the press, are placed in the press and the pressure applied as before. The heel molds are best opened with a cold chisel inserted in the mold lugs. The cured heels can be easily tapped from the cavities with a wooden mallet or the wooden handle of a rubber knife.

There are several methods of handling sole molds. I will describe here the method which seems most economical.

The sole presses are equipped with two sets of swinging tables, or arms. With a table for each plate on each side, a four-deck press would have eight tables. One set is at the left of the operator and the other at the right. On each of these tables is placed a piece of sheet iron, approximately $\frac{1}{16}$-$\frac{3}{32}$ in. thick, and slightly smaller than the size of the press plates, one edge of which is turned up about 1 in. This is to allow the press operator something to pull on in handling the molds. Sole molds are then distributed over each piece of sheet iron and each of the mold cavities is filled with a sole blank. A metal tag is then placed on top of each piece of stock contained in the molds. This metal tag shows the pressman's number, date and quality of sole as well as trade-mark. This is molded into the sole back during the cure. A second piece of sheet iron, similar to that on which the molds were placed, but without the turned-up edge, and slightly smaller, is placed over the molds containing the stock.

After all the molds have been filled and covered with sheet iron, as described, the tables are swung up against the front of the press. The press plate and the table being on the same level. By taking hold of the

turned-up edge of the bottom piece of sheet iron, the entire number of molds on the table can be pushed into the press at one time. The auxiliary is then turned on, the ram raised, and finally the high pressure used. While this set of molds is in the press, those on the other swing tables are being filled, so that the press is always full of molds.

The Cure

In press curing the plates of the press must have live steam in them. The drip from the plates should be open enough to allow the condensed steam to run off, as otherwise the pressure shown by the gauge gives absolutely no indication of the temperature in the plates. This does not mean that the exhaust valve should be open half a turn nor anything like it. The exhaust valve should be just "cracked," after the water is drawn off, and the pressure regulated by the steam admission valve.

Press plates full of water will never perform a cure. It is advisable to run the press drips into exhaust heads rather than into traps. The exhaust head seems to allow the steam to perform its work in the plates in better shape than when the steam is run into a trap.

The shorter the cure the greater is the capacity of the press. In order to shorten the cure the steam pressure must be raised, the vulcanizing temperature rising with it. In such a case the advantage is large capacity, but the great drawback is that a few minutes too long in the press spoils the goods. A sole compound cured with 60 lb. of steam for 12 mins. will not show the good aging qualities that the same compound would show if cured with 50 lb. of steam for 25 mins. If curing is to be done with high pressure steam, the amount of "cure" in the compound should be cut to a minimum, so as to prevent overcuring the stock as much as possible, through neglect of the pressman to shut off the heat at the proper time.

If the cure on a large percentage of the production always remains the same, it pays to install a system of cam control. The cam control not only controls the temperature in the press plates, but also controls the hydraulic pressure. The temperature is maintained automatically and the hydraulic pressure is shut off automatically at the end of the cure. Such a system, however, does not pay when the cures are changing from day to day, since each heat requires a different cam and these cams are fairly expensive.

Cheap sole compounds should be left well undercured; if they are not, they will crack across on a few months' aging. I might say at this point that if a pair of rubber or fiber soles is placed by the shoe manufacturer on a pair of shoes, and they show defects, such as cracking across, metal in the stock, stitches cutting through the sole it is the custom for the rubber sole manufacturer to pay

AN ACCUMULATOR

the manufacturing cost on the whole shoe. It is not a question of replacing the pair of defective soles.

Inspection

The goods are inspected after curing. Inspection at this point saves the cost of trimming goods which are found to be defective. The inspection is for the purpose of ascertaining whether the stock is properly cured, the mold properly filled, and of detecting metal in the stock as far as possible. The inspectors also distribute the cured goods to the trimmers, and keep account of the goods trimmed by each person, as this is usually done on piece work. The inspection of goods after trimming is made by the packer.

Trimming

In making soles and heels a certain amount of "flow" or excess stock, is found. This is semi-cured and should never exceed 5 per cent by weight. This flow is trimmed off, usually with shears. Recently there has been placed on the market the Wills Overflow Trimmer. This machine does very good work and pays for itself in a very short time. If soles are made for consumers' trade they should be well trimmed; if, on the other hand, they are for use by the shoe manufacturer on new shoes, the trimming need not be as particular, since the edges are buffed before the shoes are placed on the market.

Packing

Heels for use by shoe manufacturers are usually bunched in packages of twelve pairs each and shipped in wooden boxes.

Heels for the consumer, such as advertised brands, are placed a pair in each pasteboard box, about 3½ x 3½ x 1 in., together with the necessary nails for attaching them to the shoes. The small boxes are then placed in fiber board boxes and shipped. The fiber board boxes are made just large enough to contain even dozens and gross lots.

Soles are usually bunched ten rights and ten lefts in each bundle, or they are tied together. They are shipped in wooden boxes.

Permits Use of German Patents

A decision of far-reaching importance was recently made by the Federal Trade Commission when they announced that enemy-owned patents and copyrights will be licensed for manufacture in the United States beginning Nov. 1. This will release the vast store of German scientific information to American manufacturers and will enable them to manufacture various articles, which heretofore had not been possible nor desirable in view of the high royalties demanded.

Approximately 20,000 patented and copyrighted articles are said to be affected by the commission's order. These include dyestuff formulas of vital importance to American industries and various mechanical devices of wide use.

The regulations follow the law closely in safeguarding the interests of patent owners, who must be reimbursed for the use of their inventions, and provide that licenses will be issued only where the interests of the public demand a supply, which is not now being met. The licensee must give evidence of ability to manufacture the article.

Rubber Air Bed for Soldiers

A service bed has been designed by an English concern, which will fit into a small valise when folded. It is made of a fabric strong enough to withstand hard wear. When it is to be made up, an inner casing of rubber is inflated by means of two valves. Should it be torn or punctured, the rubber can be repaired in the same manner as a tire. The bed is twenty-three inches wide, but to accommodate those who find comfort in sleeping with the knees slightly raised, the knee rest has been made seven inches wider on each side.

Technical Course in Rubber Manufacture*

By H. E. Simmons, M.S.

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SECTION XIII

The Manufacture and Use of Inorganic Fillers

It will be our idea in this and the section which follows dealing with the same subject, to give the reader some information in regard to the manufacture of the materials which are used in compounding rubber and also some information in regard to why certain materials are used. In the vast majority of cases, little is known of the substances used in compounding and it seems that the increasing of this knowledge should add interest to the subject and everyone will grant that increased interest tends toward greater efficiency.

Far be it from us to deal at any length with all the inorganic compounding ingredients, or even to mention them. We shall simply pick out what may be regarded as the commonest ones, those used in practically every factory to a greater or less extent.

In order to present this matter in some definite system, the writer will group these ingredients under four headings:

First—Substances essential for vulcanization.

Second—Accelerators.

Third—Fillers.

Fourth—Pigments, which will be subdivided into classes according to colors.

This is not the only classification and perhaps it is not the best one but it will serve our purpose here. These different groups overlap as will be seen from the order which follows.

Under the first group we shall consider sulphur, which we may say is essential in all processes of vulcanization; sulphur chloride; carbon bisulphide and carbon tetrachloride, which are used in certain kinds of vulcanization.

Under the second class, inorganic accelerators, the few we shall consider are the ones commonly used, namely:

Litharge,	Lime.
White lead.	Magnesia calcined.
Sublimated white lead,	Magnesia carbonate.
Red lead,	Magnesite.

Under the third class, fillers, we shall discuss substances which, as the name implies, may be obtained on the market at a price to enable the manufacturer to use them in large quantities, substances which chemically are more or less inert, such as

Barytes,	Kaolin, China Clay.
Alumina oxide,	Talc, Soapstone.
Aluminum Flake,	Fossil Flour,
Whiting,	Asbestos,
Clays,	Blue Lead,
Silica (Atmoid),	Magnesite.

There are several more which might be classified here but seem better to appear in the fourth group, pigments:

White Pigments

Zinc white,	Barium sulphate,
Lithopone,	Barytes,
Zinc sulphide,	Kaolin.

Red or Brown Pigments

Antimony Crimson,	Vermilion.
Antimony Golden,	Venetian Red,
Rouge,	Indian Red.
Red Ochre.	

Black Pigments

Lamp Black,	Graphite,
Bone Black,	Lead sulphide.
Hydrocarbon,	

Yellow Pigments

Yellow Ochre,	Cadmium sulphide.
Chrome Yellow,	Arsenic sulphide.

Green Pigments

Chrome Green,	Rinmann's Green.
Ultramarine Green.	

Blue Pigments

Ultramarine Blue,	Prussian Blue.
Thenard's Blue,	Chrome Blue.

Above are the substances which will be dealt with in this article and the one which follows.

Sulphur

The substance, sulphur, with which every man in a rubber factory is acquainted, was also known to the ancients, for Homer 900 B.C. recorded that it was used in medicine and in fumigation. In 800, Gebir put forth the idea that all metals were compounds of sulphur and mercury and that it was possible to change from one metal to another by changing the ratio between these two substances. Lavoisier was the first to recognize it as an element.

The use of sulphur in rubber, however, remained a secret until Goodyear, in 1839, and Hancock independently in 1844, showed its effect upon rubber when heated in contact with it.

This element occurs in many different ways in nature and is well distributed over the earth. It is found in the free state in large quantities in Sicily and Louisiana. It occurs in the form of sulphides of the metals like iron, copper, lead and zinc; in the form of hydrogen sulphide in certain springs; as sulphur dioxide issuing from volcanoes; as sulphates of many elements like lead, barium, calcium, and strontium; then in organic substances like albumen, horn, etc. We must realize, therefore, the great distribution of this element in nature.

It has been estimated that the deposits of sulphur in Sicily, still untouched, contain fifty-five million tons, and that it will require about one hundred years to exhaust them. Up to the year 1900, it is claimed that 95 per cent of the world's production of sulphur came from Sicily, but in 1908, the United States produced 45 per cent of that amount, and from that date has continued to produce more and more.

Just a few words in regard to the methods used in Sicily and the United States for obtaining this sulphur. In Sicily, the sulphur is found from 150 to 600 feet below the surface of the earth. It is reached by inclined winding shafts. In earlier times, all of the sulphur was brought to the surface upon the backs of men, women, and children, but modern methods of mining are in general use there now, and it is raised by mechanical means.

The ore is first graded into rich, good and ordinary lots. These ores were formerly made into piles and then fire was set to the piles. As part of the sulphur burned, its heat of combustion would melt the remainder, which would run down through the pile and collect in a trench around the original heap. This method, of course, caused a great loss, and in addition, the vapors of sulphur dioxide damaged the health of the people and killed the vegetation for miles around. By this method only about 25 per cent of the sulphur was actually obtained.

Next in line of advancement came the method of building larger heaps of ore and covering them over with earth, just leaving here and there shafts through the heap. Wood was placed in these shafts and kindled. Some of the sulphur would burn and thus melt the remainder, which was collected. These piles would require from one to two months to burn out. From these as high as 60 per cent of sulphur was obtained.

The next improvement came in 1880, when Gill proposed his regenerative furnace. He constructed two large brick chambers, which communicated with the same chimney so that while one was burning, the

other might be in the process of charging. The combustion here could be more perfectly regulated, and as these chambers had a double bottom, thus separating the ore from the collected sulphur, a decided advance was made. As high as 75 per cent of the sulphur was obtained by this method.

The next great improvement came in 1891, when the removing of the sulphur from the ore was effected by the use of superheated steam. This was accomplished by building horizontal iron cylinders, equipped with a tight-fitting door and a track which would allow small iron cars, with perforated bottoms, containing the ore, to be run into this drum. The door is closed and steam at 130 deg. C. admitted, when the sulphur melts, runs to the bottom of the drum, which is slightly inclined and then into a well which serves as a receptacle for the molten sulphur. This process is rapid, gives from 80 per cent to 90 per cent of the total sulphur, and does away with the objectionable sulphur dioxide fumes of the former methods.

All of these methods produce crude sulphur and this must then be refined. This refining process is accomplished by heating the crude sulphur in retorts and distilling it and condensing it in large chambers. If the temperature of these condensing chambers is above 114 deg. C., then liquid sulphur is obtained, which is drawn off into molds and known as brimstone. If the temperature is maintained below 100 deg. C., then flowers of sulphur will collect.

The deposits of sulphur in Louisiana occur about 1000 ft. below the surface of the ground. The method of obtaining this sulphur was suggested by Frasch. He drilled a well, similar to that used for extracting petroleum from the earth, then into this casing, he imposed three other concentric tubes, lined with aluminum, which would not be attacked by the sulphur. Superheated water was forced down through the outer pipe. When it came in contact with the sulphur, the latter melted, and was forced part way up the inner tube.

To bring it the remainder of the distance, aluminum pumps were tried but were not strong enough to support the strokes of the piston. The difficulty was then overcome by forcing air down the inner tube which emulsified the sulphur, thus making it very light and it rose to the surface. Here it was collected in large wooden boxes where it solidified.

By simply melting this sulphur again in iron boilers by use of steam and drawing it off into suitable molds, a sulphur of higher than 97 per cent is obtained. It is estimated that the Louisiana deposits contain at least forty million tons of sulphur.

Sulphur exists in three forms. The most stable is the rhombic variety which has a specific gravity 2.06 and melts at 114.5 deg. C. The monoclinic is next in stability and has a specific gravity of 19.2. Above 95 deg. C., the rhombic changes into monoclinic and vice versa. If boiling sulphur at a temperature of 445 deg. C. is poured into water, there results a form devoid of crystalline structure and called amorphous, or plastic sulphur. It resembles rubber in many of its physical properties but soon changes back into the rhombic variety. Therefore when sulphur is added to rubber and vulcanized at 45 lbs. pressure of steam that is equivalent to a temperature of 175 deg. C. and our sulphur must be above the temperature at which rhombic exists and in fact approaching the temperature at which the amorphous exists.

Rhombic sulphur exists in two modifications, roll sulphur or brimstone and flowers or flour of sulphur. It is the latter modification which is largely used in the rubber industry. In some places, they grind brimstone, sift it, and it gives equally as good results.

The flowers of sulphur results from the sublimation of sulphur as was pointed out above. Its specific gravity runs about 2.0 and it contains some modifications which are insoluble in carbon bisulphide.

It always contains some free sulphuric acid due to its slow oxidation in moist air. The sulphur should be examined from time to time to ascertain the amount of free acid, which should not show more than 0.2 per cent calculated as H_2SO_4. It should contain practically no ash, in fact the presence of any suggests adulteration, generally with an infusorial earth.

Sulphur is sometimes used in sulphur baths into which forms to be vulcanized are dipped, and here it serves simply as a heat carrier in the place of the more usual steam pressure or hot air.

Sulphur monochloride, S_2Cl_2, was found to have the property of combining with rubber to produce a substance resembling the sulphur vulcanized rubber. It has the power of entering into this chemical union at ordinary temperature, thus we have by its use what is known as the "cold cure" process.

It is made by passing dry chlorine gas over molten sulphur, when the two elements combine in the ratio of S_2Cl_2. It distills out of the apparatus and is condensed as a reddish yellow liquid with a boiling point of 138 deg. C and a specific gravity of 1.69. Moisture decomposes it in the following manner.

$$2\ S_2Cl_2 + 2\ HOH \rightarrow SO_2 + 3\ S + 4\ HCl$$

Therefore when it is used in the rubber industry, moisture must be excluded as far as possible.

Sulphur is readily soluble in the monochloride and the monochloride is likewise converted into the dichloride by treating it with an excess of chlorine. So when examining the monochloride, we necessarily look for these two substances, sulphur and sulphur dichloride as impurities. The presence of these affects the boiling point of the monochloride and that gives us a very easy method of ascertaining the relative purity of our material. In commercial work, a range in boiling point from 130 deg. to 140 deg. C is allowed.

The dichloride has its boiling point at 64 deg. C, and it is a very objectionable impurity in any amount. The dissolved sulphur may run as high as 5 per cent. If more than this is present, the cured article will "bloom" or "sulphur up." This is determined by distilling off the chloride and extracting the residue with carbon disulphide, which dissolves the sulphur, placing the solution in a tarred flask, evaporating the solvent off and drying at 110 deg. C, when the sulphur remains and is determined.

Pure sulphur chloride should contain 52.5 per cent of chlorine. It is generally used for vulcanizing processes in a dilute solution of carbon bisulphide or carbon tetrachloride and the articles to be cured are dipped into this solution. The action is only a surface action and therefore may only be used with thin articles. In some cases the articles to be cured are subjected to the vapors of sulphur chloride when the desired reaction takes place and a glossy surface is produced. It finds extensive use in the manufacture of rubber substitutes. Its use here will be discussed at greater length in a section which is to follow and which deals entirely with the question of "substitutes."

Because of the use of carbon bisulphide and carbon tetrachloride in the "cold cure," it seems perhaps wise to devote a little space here in considering these substances.

Carbon bisulphide, like the chloride of sulphur, is made by the direct union of the elements. The apparatus for effecting this action consists of a tall, heavy walled cast-iron retort which is filled with carbon, generally coke, and heated to red heat. At the bottom of this retort, there enters a slow stream of molten

sulphur which, coming into the retort, immediately changes into vapor and then combines with the carbon forming the bisulphide. This at the temperature of the retort is a gas and thus passes out the top into a system of condensers which first remove from the bisulphide any sulphur vapors which may have been carried along with it; then into a water condenser which condenses the bisulphide.

This is of course the crude product and for the majority of cases must be purified. This is done by adding to it a little lime water and shaking it, then placing it in a still with about a 1 per cent solution oil, a little water and some lead acetate. When the bisulphide is distilled out, it will represent a fairly good grade.

This substance is used very extensively outside the rubber industry. Up to 1850, however, practically its only use was in connection with the rubber industry, and then as to-day it was used as a diluent in the cold cure process, and as a solvent for rubber, hence coming its use in the preparation of rubber cements.

It boils at 46 deg. to 47 deg. C, and has a specific gravity of 1.27. It generally contains some dissolved sulphur, which may be determined by distilling a 100 c.c. out of a tared flask. It should show at most two grams of distillation residue per liter. Having such a low boiling point, it evaporates very rapidly and with the air, forms a very inflammable mixture often causing bad fires. Its vapors are also poisonous and may produce serious results upon the workmen. The tetrachloride of carbon is made by passing dry chlorine through CS_2 which contains a little iodine and a catalyst of asbestos impregnated with magnesium chloride is suspended. The reaction takes place as follows:

$$CS_2 + 3\,Cl_2 \rightarrow CCl_4 + S_2\,Cl_2$$

These two products may be separated by distillation, but it has been found that in the presence of a little powdered iron, the following reaction will take place:

$$CS_2 + 2\,S_2\,Cl_2 \rightarrow CCl_4 + 6\,S$$

These resulting products are separated by distillation and the sulphur is used to produce carbon bisulphide again.

The tetrachloride is purified by washing it with a solution of caustic soda and then distilling from a solution of calcium hypochlorite. It boils at 77 deg. C. and has a specific gravity of 1.63. It is an excellent solvent for fats and resins and has the great advantage of being uninflammable. It even has the power of rendering certain inflammable solvents uninflammable when it is added to them. Its great use in the rubber industry is that it is mixed with coal tar naphtha and will produce non-inflammable rubber solutions, and likewise its use as a diluent in the cold cure process.

To test the commercial variety of the tetrachloride, it should distill between 75 deg. and 78 deg. C. and leave no residue. The determination of its specific gravity will generally reveal the presence of any adulterants.

Inorganic Accelerators

The second group of materials we called inorganic accelerators or "sulphur carriers" as they have sometimes been called. The theories advanced in explanation of their action in hastening vulcanization will be reserved for the article dealing with the theories of vulcanization.

The one which has been used to greatest extent is probably litharge, the monoxide of lead. It is made by heating the metal lead in a reverberating furnace with a current of air passing over it. It requires some time for the oxidation to be complete and must also be watched that some of the other oxides of lead are not formed. The yellow powder formed in the above process is called Massicot. When this is melted and then allowed to cool rapidly, the mass which results is called litharge. It has a specific gravity of from 9.2 to 9.5. Considerable litharge is also made to-day in connection with the refining of silver. The lead is removed from the molten silver when it is oxidized with a current of air to the monoxide. It then floats on the surface of the silver and is removed.

Litharge is generally supplied in a high state of chemical purity, but varies considerably in degree of fineness and this of course has an influence upon its color. Litharge is slightly basic and therefore tends to absorb carbon dioxide, which is objectionable. A sample should therefore dissolve in dilute nitric acid without any effervescence, and without leaving a residue of the dark colored lead peroxide, which is very objectionable.

It may contain some unoxidized metal, which does no harm and may be detected by dissolving the litharge in acetic acid instead of nitric. It is always well to test the resulting solution for copper as that is objectionable even in small amounts.

Litharge might well be classed under the heading of Black Pigments as it imparts that color to the vulcanized rubber due to the formation of its sulphide. Until recently, nearly all of the black and dark gray rubbers were colored with litharge but at present it is used largely on account of its accelerating action upon vulcanization.

White lead is a basic carbonate of lead and has an accelerating action upon the rate of cure but to a less degree than litharge. As a pigment, it does not possess the coloring power which litharge has. It gives the article more of a bluish gray color.

It is made by several different methods, some requiring a long period of time, others proceeding more rapidly. From the white lead manufacturer's point of view, the rapid method is naturally the one to be preferred, but from the consumer's viewpoint, the products of the slow process seem to be desired most.

The Old Dutch Process consists in subjecting lead plates to the action of acetic acid and carbon dioxide formed by fermentation. This first produces the acetate of lead, then the basic acetate, and finally after a lapse of five or six weeks, the basic carbonate, a white lead, results. The white lead is freed from any uneffected lead or acetate by washing with water. The Germans have a quicker method where they blow steam and acetic acid vapors into chambers containing lead plates and then bring into these same chambers carbon dioxide from a coke furnace and the basic carbonate of lead results. It is washed and dried, and ready for market.

The French dissolve litharge in acetic acid forming the basic acetate and then pass carbon dioxide through this until the white lead is formed, settles to the bottom, is transferred to a filter press, dried and ground.

The Russian white lead is made by producing the neutral lead carbonate by the action of carbon dioxide upon the basic acetate of lead. The neutral carbonate is then made into a paste with water, about 1 per cent of lead acetate added, and also 30 per cent of lead oxide. The whole mass is stirred in the cold with the addition of a little water until it all hardens. In from three to four hours, the process is complete and a fine grade of white lead results.

There is a method whereby the freshly precipitated lead sulphate is converted into the basic sulphate by heating with caustic soda, then when this solution is heated with sodium carbonate, the white lead is precipitated. In this country, atomized lead is produced by blowing a jet of steam against small holes where molten lead is issuing. This "lead sand" is then treated with dilute acetic acid for about seven days, while air, carbon dioxide, and a little steam are blowing through the vats.

White lead results which is washed from the unaltered lead.

The water of hydration which may be present in white lead often causes "blowing." It has a specific gravity of 6.1 to 6.2.

Sublimated white lead is not what the name implies, a carbonate of lead, but is the basic sulphate. It is increasing in favor as it does not tend to produce "blowing." It accelerates more than white lead, and produces a black product when vulcanized. It is a velvety powder and mixes readily with the rubber. It has a slightly higher density than white lead.

Red lead, or minim, is the tetroxide of lead, or really it may be thought of as a mixture of lead monoxide and dioxide.

$2\ PbO + PbO_2 \rightarrow Pb_3O_4$ (Red Lead)

It is made by heating litharge in a reverberating furnace at a temperature of 450 deg. C., but must not be allowed to melt. The best grade is made by heating the monoxide of lead with sodium nitrate in an oxidizing flame to a dark red heat. It has a specific gravity of 8.6 to 9. It is one of the most powerful inorganic accelerators, perhaps due to the heat of reaction between it and the sulphur. It is used in rapid curing stocks. It can be used only within certain limits as it will attack the rubber due to its strong oxidizing power.

The adulterants that must be looked for are calcium carbonate, barytes and ferric oxide.

Under the term "Lime," we largely, in connection with rubber, refer to the hydroxide of calcium which is "slaked lime," in contrast to "quick" or "burnt lime" which is the oxide of calcium. The latter is made by heating limestone, which is calcium carbonate, in kilns to a temperature of 1,000 deg. when it loses its carbon dioxide and quick lime results. When this is mixed with about one-third of its weight of water, the white, powdery, swollen mass of slaked lime results. If more water is added, the soluble alkalies are washed out and a softer powder will result. It has a specific gravity of 2.1 and has a finer grain than the quick lime. It is added only in small proportions.

In small quantities, it takes up the moisture which may be present in a stock and thus prevents blowing. It has the power of combining with the free sulphur and thus tends to prevent "blooming." Excess of lime tends to diminish the resiliency of rubber and also makes it harder, having that effect even in hard rubber articles. It also has an accelerating action upon the rate of cure.

Lime should be fairly free from carbonate and silica and upon ignition show close limits to that of $Ca(OH)_2$, that is, 24.3 per cent. Manganese is sometimes present in lime and renders it useless for the rubber manufacturer. It affects rubber in the same manner as copper does.

There are several forms of magnesium compounds in use. We have two kinds of calcined magnesia (which is the oxide), known as "heavy" and "light" calcined.

If to a hot solution of a magnesium salt, a hot solution of soda is added, there will be formed what is known as heavy magnesium carbonate and when this is calcined, the heavy magnesia results. If, on the contrary, cold solutions are used, the light carbonate will be formed, and when this is calcined the light magnesia results. The only difference therefore is in the structure of the two.

It is used in the same manner as lime. Its specific gravity is 3.2 to 3.6 and it is a little coarser grained. It possesses marked accelerating power upon the rate of cure and also increases the toughness of the product more than 10 per cent except in rapid curing stocks.

The magnesias suffer varying ignition losses ranging from 2 to 20 per cent. When a compound has been made up with a certain grade of magnesia, then deliveries which follow should not be allowed to vary much from the ignition loss of the original. Rubbers running high in resins seem to give better results when compounded with magnesia.

There occurs in nature the mineral, magnesite, which is the carbonate of magnesium, of sufficient purity that it may be used in compounding. The carbonate is also artificially made as pointed out above.

These substances possess very little accelerating power, and are used largely as fillers. As fillers they may be employed up to 30 per cent without seriously injuring the rubber.

In the next section of the course we will consider fillers and pigments.

Horsepower of Rubber Belting

The following method for finding the horsepower of rubber belting is taken from the *Southern Engineer*, and is the result of numerous experiments conducted by the Cincinnati Rubber Manufacturing Co.

Let D represent the diameter of the pulley in inches;

Let R represent the revolutions per minute;

Let W represent the width of belt in inches;

Let H represent the horsepower that can be transmitted by the belt, the pulleys being equal in diameter.

Problem 1. To find the horsepower that a four-ply belt will transmit, the size of the pulley and the width of the belt being given:

$$\text{Formula:}\quad H = \frac{D \times R \times W}{2750}$$

Problem 2. To find the width of belt required to transmit a certain horsepower, size of pulley being given:

$$\text{Formula:}\quad W = \frac{H \times 2750}{D \times R}$$

Problem 3. To find the diameter of the required pulley, the horsepower and the width of the belt being given:

$$\text{Formula:}\quad D = \frac{H \times 2750}{R \times W}$$

Problem 4. To find the necessary revolutions per minute, when the horsepower, diameter of pulley and width of belt are given:

$$\text{Formula:}\quad R = \frac{H \times 2750}{D \times W}$$

If, however, the driving and driven pulleys are not equal in diameter, the arc of contact with the smaller pulleys should be determined from the following table, and the proper constants be substituted in place of that used in the previous examples:

Arc of Contact	Constants
90 degrees or ¼ circle	6080
112½ degrees or 5/16 circle	4730
120 degrees or 1/3 circle	4400
135 degrees or ⅜ circle	3850
150 degrees of 5/12 circle	3410
157½ degrees of 7/16 circle	3220
180 degrees or ½ circle	2750

Example—A twenty-inch, four-ply rubber belt runs to a pulley 48 inches in diameter, which revolves 150 times per minute. The arc of contact is 150 degrees. How many horsepower will it transmit? (Use formula 1 and table of modification.)

$$H = \frac{48 \times 150 \times 20}{3410}$$

A four-ply belt is equal in power to a single-ply leather belt, while six-ply rubber is equivalent to double leather, and a double leather belt is presumed to have a transmitting efficiency over the single belt as ten to seven, but care should, however, be exercised in the use of thick belts over small pulleys. Best results are obtained by the use of as few a number of piles as are necessary to transmit the horsepower required as belts made unnecessarily heavy are too stiff to have the proper pulley contact.

To find the proper ply of belt to use, multiply the horsepower by 12,000 and divide by the product of the belt width in inches, the pulley diameter in inches, and the number of revolutions per minute.

Digest of the Foreign Rubber Press

The India Rubber Journal, Dec. 15, 1917

Germany and Raw Materials—Among items of news is a report of an interview granted by General Scheuch, Chief of the German War Board, to the *National Zeitung*. A cessation of work in some factories, owing to a shortage of coal and raw materials, is said to have been overcome, and it is observed that the supply of coal is sufficient for the production of ammunition, while the supply of other raw materials is unlimited. Several raw materials, says the interviewer, which have been discovered during the war, have proved to be such a success that they will remain in use afterwards, an additional advantage being their low cost.

Some of these "newly discovered" and "low priced" materials are then enumerated: paper and nettle products, nitrates from the air and *synthetic rubber*, and it is noteworthy that *no one* of them has been discovered during the war, though all have no doubt reached a greater development during hostilities.

Paper yarn was known and manufactured before the war, though no one would have dreamt of applying it to some of the uses to which it has since been put in Germany, uses by the way to which it is very little suited. Nettle fibre was known, as may be seen on reference to the technical literature of forty years ago.

The manufacture of nitrates from the air was known and practised; and synthetic rubber was known, though believed to be commercially impracticable. What developments have taken place in this last manufacture it is difficult to say, but one has a shrewd suspicion that General Scheuch might, with a gain to his accuracy, have excepted synthetic rubber from the list of new raw materials which possess the advantage of being low-priced. Why otherwise this pressing desire to smuggle in raw rubber at any price?"

Rubber Plantations Dividends—It has recently been pointed out that the increased cost of all materials required on the estate (rubber plantation), the enormous increase in freight and insurance charges, and the reduced average price of plantation rubber must at an early date be reflected in the profits, and therefore dividends, of plantation companies. Most of the annual reports being issued at the present time indicate an average gross price for the last financial year of about 2*s*. 7*d*. per lb. It is common knowledge that the average prices being realized today are round about 2*s*.

The Excess Profits Tax very rarely absorbed—on an average—more than the equivalent of about sixpence per pound of rubber harvested, and it is therefore clear that the first effect of this reduction of profits will be to reduce the amount contributed to Government by way of Excess Profits Tax. It is feared, however, that the loss to the Chancellor of the Exchequer will not be the only effect. It is clear from the annual reports issued during this month that reductions in dividends will have to be faced by shareholders. As previously intimated, we believe these reductions will apply to most companies, whether in the developmental or the mature condition.

The Ventilation of Rubber Boots—In the issues of September 15 and November 10, reference was made to the matter of ventilation of rubber boots, it being mentioned that certain firms in America made these boots as far back as 1890. It has been since learned that a British firm, the North British Rubber Co., Limited, Edinburgh, made and sold these boots as far back as 1886. They were covered by a Patent No. 10994—1886.

These ventilated boots have insoles made of suitable material, perforated with holes, and supported on the under rubber insoles of the boots by detached narrow bars of leather, india-rubber, or other suitable material, attached to the perforated insoles. These bars thus form chamber spaces between the two insoles, which spaces are connected with the outside air by means of channels or tubular openings carried up the sides of the boots.

The India Rubber Journal, Dec. 1, 1917

The Compo Sole in America—The manufacture of composition soles for leather boots and shoes, made from rubber, fibre, etc., which was started in a small way near Boston about three years ago, has now reached enormous proportions, having been taken up by scores of manufacturers, large and small.

Those rubber manufacturers who advertise freely that their waterproof soles are not rubber are, to put it mildly, writes a correspondent, stretching the truth a bit, because everyone in the trade knows the composition soles are made from contains rubber and some kind of fibre, usually fibreized leather.

Australian Government and Rubber Prices—It is fairly well known that there are several important rubber manufacturing concerns in Australia, and that the freight difficulties experienced by them have been considerable, and are likely to increase in the immediate future. A certain amount of rubber is grown in the Pacific Islands, and this source of supply has been drawn upon by rubber manufacturers in Australia.

It is now learned by cable that the rubber manufacturers of Australia have agreed to purchase rubber grown in Oceania at prices fixed by the Government. In all probability this agreement is to apply only to the amount of raw rubber required by Australian manufacturers. The Australian Government can hardly fix a price at which any group of manufacturers can buy for market operations in addition to their own requirements. The exact price has not been disclosed, but it will in all probability be in relationship to the price in Colombo after the usual freight and other charges have been allowed for. This, we think, is the first time rubber growers, rubber manufacturers and Government have formed any agreement with regard to the price of raw rubber from plantations.

The India Rubber Journal, Dec. 8, 1917

Dutch War Tax and Rubber—Holland is now bringing into force a War Tax Enactment which was passed some considerable time ago. It is reported that several British corporations operating rubber plantations in the Netherlands East Indies and having holding companies domiciled in Holland have received their assessments for payment of the Dutch war tax in Holland but so far no information has been given out as to the basis on which the individual assessments have been made.

There has also been much talk of placing a duty on excess profits in Java and Sumatra, but this proposed tax must not be confused with the Dutch War Tax.

Writing on this subject, our English contemporary says: "British companies sometimes have their holding company registered in Holland, at other times in Java and Sumatra, so that in either case tax will be payable to the Dutch authorities. The two taxes, however, must be regarded as quite distinct. Though the actual basis of assessment has not been disclosed, there is good reason to think that the Holland War Tax is based not merely on the total profits, but in relationship to the actual crops harvested during the three years 1914, 1915 and 1916. It is widely believed in this country that companies do not become liable to the tax where the increase in crop of coffee, cocoa, rubber, or any other tropical produce is due to young areas coming into bearing, or to the increase in crops from the plants as they grow older.

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THE RUBBER AGE AND TIRE NEWS

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Vol. II | January 10, 1918 | No. 8

THE year that has just closed has been a notable one in the American rubber industry. Its tremendous growth may be clearly grasped by the fact that there were imported into this country during 1917 approximately 160,000 tons of crude rubber—a far larger amount than the entire world's production not many years ago.

In spite of war conditions, rubber factories have expanded their facilities to keep pace with the ever increasing demand for rubber products, and though now the manufacturers are looking at all matters of business with greater conservatism than heretofore, it is plain that the rubber industry is still growing and is still planning to expand.

The past year has shown the greatest range in prices of commodities ever known in the history of the country. Rubber products while sympathetically following fluctuations have remained more stable than most lines. Raw rubber and manufactured rubber have not followed the sensational advances of metals and foodstuffs. Whether this reflects the firm stability of the industry, or indicates that the period of overproduction with its era of lower prices is approaching can only be determined after the war. The present situation is a very satisfactory one and no serious apprehension is felt for the immediate future.

Upon the declaration of war, in April last, general conditions changed rapidly in the commercial world; it was difficult for anyone to forecast the future with any degree of certainty. The shortage of many materials used by rubber factories offered cause for serious apprehension; the costs of many materials advanced; the pay of labor rose; consequently the cost and the selling price of manufactured rubber goods increased. The situation in the rubber industry, however, was not nearly as acute as in many other lines.

The upward movement of costs and prices continued throughout May and June and supplies of raw materials in many directions were lessened by the growing demand for them. Many raw materials doubled in value and rubber manufacturers began discussing labor, the scarcity of which was becoming a serious problem.

In July, conditions outside of the rubber trade proper caused business to be dull in most rubber lines. The Russian situation, the huge financial operations that were under way, the unsettled condition of legislative affairs and shipping problems all had the natural effect of making business cautious.

The impossibility of "business as usual" began to be realized in August when "unusual business" grew to be "usual." The general tendency was then towards short terms, cash payments, limited contracts, and conservation of energy that had previously been wasted in pleasure. It was said that the capital required to swing a given volume of business was twice as large as necessary prior to the war. The changes brought about by the war were beginning to be realized throughout the country and merchants were holding back and striving to keep assets liquid so as to be able at all times to meet varying conditions of trade. Business was not proceeding "as usual"; it was feeling the effects of the war, which it had to overcome.

Conditions in different lines of rubber goods and also in different concerns manufacturing or selling the same line of rubber articles, varied more than ever before in the history of the trade. One manufacturer or dealer found business very dull, while his neighbor reported good business, and both were telling the strict truth.

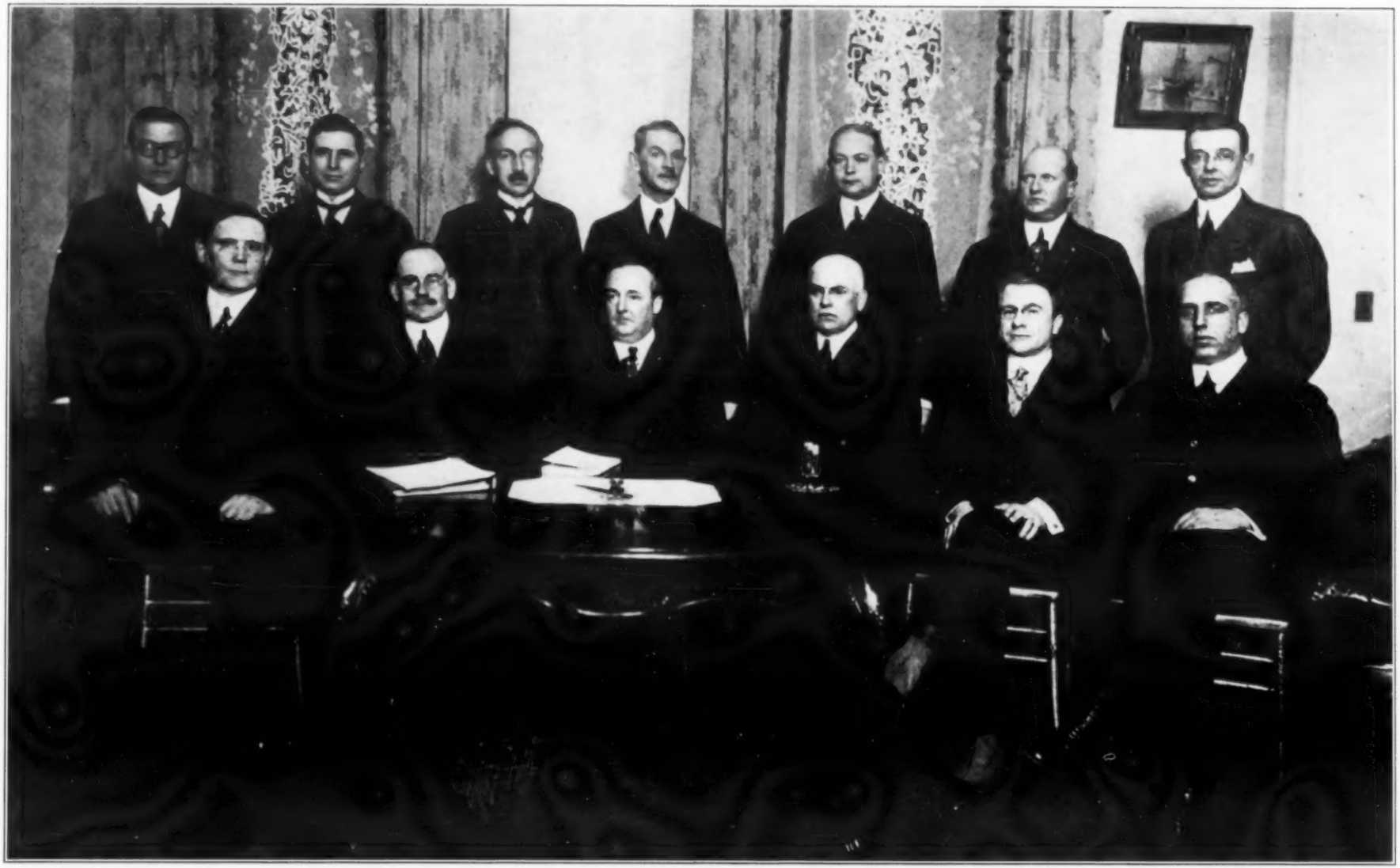
In September the rubber trade became quiet. Everybody felt that one was on the eve of great changes due to financial operations for the benefit of the Government. The wholesale trade was less active than usual at that time of the year, while retail business showed slight expansion. Markets were beginning to readjust themselves to new conditions; buyers were hesitating to place contracts running any distance ahead.

October witnessed a revival of optimism in the trade in spite of the steadily increasing costs of manufacture and distribution, and the scarcity of labor. Collections throughout the trade were closer and averaged in better shape than usual, all hands showing a desire to keep their bills paid promptly and to avoid all extensions. Confidence became general.

The problems of labor and fuel shortage became of serious concern in November. The Fuel Administrator of the Federal Government started a survey with a view to curtailing non-essential manufactures and it became apparent that the Government intended to eventually apply this principle to manpower in order to release men for war work.

By the close of the year, the possibility of tight money in the banks became a factor in the calculations of many rubber manufacturers and business men in other lines; distributors were expecting a continued contraction in civilian purchases, and this movement might well become noticeable in a few months from now.

At the present time the coal shortage existing throughout the country has already resulted in substantially curtailing the output of rubber factories and plants using rubber goods, and it is expected that this tendency will make itself felt throughout the balance of this month for it will take a long time to fully stock up the factories that have run short of fuel.



MEETING OF THE NEW BOARD OF DIRECTORS OF THE RUBBER ASSOCIATION

Left to right, standing: Harry S. Vorhis, secretary; Charles T. Wilson, A. D. Thornton, William J. Kelly, William E. Bruyn, Charles A. Davol, John S. Lowman.
Sitting: John A. Lambert, George B. Hodgman, Bertram G. Work, president; Charles A. Daniel, Harry T. Dunn, second vice-president; Paul W. Litchfield

Photo by Press Illustrating Service

Annual Meetings of the Rubber Association

More than seven hundred and fifty men, prominent in the rubber industry, congregated at the Waldorf-Astoria Hotel, in New York, on January 7, to take part in a series of meetings of the various divisions of The Rubber Association of America, which culminated in the annual meeting and banquet of that association.

The first meeting on the schedule was that of the Foreign Trade Division of the Rubber Association. This meeting, however, was postponed.

The Rubber Sundries Manufacturers' Division met at 10 a. m. and confined its attention to routine business and to the re-election of officers elected last year.

At the annual meeting of the Rubber and Fibre Sole Manufacturers' Division, held at 11 a. m., C. H. Oakley, of the Essex Rubber Co., Trenton, N. J., was elected chairman, and W. M. Gunlock, of the United States Rubber Co., System, New York, was made vice-chairman. The consensus of opinion expressed as this meeting was that sole and heel lines will undoubtedly become a big factor in the rubber industry. The following executive committee was constituted: George E. Hall of the Boston Woven Hose & Rubber Co., Boston, Mass., Charles Measure of the Federal Rubber Manufacturing Co., Cudahy, Wis., George B. Dryden, Dryden Rubber Co., Chicago, Ill., E. T. Packard, Avon Sole Co., Avon, Mass., and W. M. Gunlock, United States Rubber Co., System, N. Y.

The Rubber Proofers' Division held a luncheon meeting at which the officers of the past year were re-elected. The same was the case at a luncheon meeting held by the Rubber Reclaimers' Division.

John D. Voorhees, president, Voorhees Rubber Manufacturing Co., Jersey City, N. J., and W. O. Rutherford, general sales manager, The B. F. Goodrich Co., Akron, Ohio, were elected chairman and vice-chairman, respectively, of the Mechanical Rubber Goods Manufacturers' Division, at the annual meeting of that division.

Annual Meeting

The annual meeting of The Rubber Association of America was called to order at 2.45 p. m., in the Myrtle Room of the Waldorf-Astoria. Van H. Cartmell, Kelly-Springfield Tire Co., New York, first vice-president of the Rubber Association, presided; Harry S. Vorhis, the secretary reading.

At the request of the chairman, the secretary read the call for the 1918 meeting, and the minutes of that of 1917, which were approved as read.

In the absence of Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio, president of the Rubber Association, no report of the president was presented and Mr. Vorhis proceeded to read the treasurer's report, which was duly received and placed on file.

Secretary's Report

The next order of business was the report of the secretary, which was presented by Mr. Vorhis, as follows:

"Since our last annual meeting the firm membership of the Rubber Association of America, Inc., has increased to 315 firms in the rubber and allied industries which is an increase of 84 firms during the past year. It may now be said that the Association comprises nearly all firms of importance and standing in rubber manufacturing and its allied industries as well as the crude rubber importers.

"During the twelve months covered by this report the Executive Committee has held fourteen meetings and the Board of Directors seven sessions. Numerous committee meetings of the general Association as well as all Divisions have been held at the Association headquarters where the Directors room is always at the disposal of our membership for meeting purposes.

"The rubber Advisory Committee which is now known as the Committee on Rubber and Kindred Products has held fortnightly sessions and since the War Trade Board has taken over the control of crude rubber importations the Committee has been holding weekly sessions in order to deal with the numerous requests for information which come from the War Trade Board.

"The organization of the various groups of manufacturers as divisions of the association was accomplished previous to our last annual meeting and a very satisfactory year of work can be reported from all of these organizations.

"Our annual mid-summer outing was omitted last summer but a Golf Tournament was held at the Trenton Country Club, Trenton, N. J., in the middle of October, which brought together 200 members in the industry and proved a most enjoyable occasion. Our president, Mr. Firestone, entertained the directors and members of standing committees which had served during his two terms as president at his home in Akron on November 17 and 18 last, and made this the occasion of a special dinner of rubber manufacturers in the neighborhood of Akron which was held at the Portage Country Club, on November 17. This also proved a most enjoyable occasion and helped to the solidarity of the Association.

"The banquet of 1917 was held at the Waldorf-Astoria on the evening of January 8, 1917, the attendance being well over 600, an increase of over 100 per cent over 1916.

"We have lost the following members by death during the past year:

SAMUEL WRIGHT, of the Philadelphia Rubber Works Co. and Treasurer and General Manager of the Acushnet Process of N. Y., Inc. Died at Yonkers, N. Y., January 18, 1917.

Captain RICHARD S. SATTERLEE, Vice President, The Habirshaw Electric Cable Co. Died at New York, N. Y., February 15, 1917.

EDWARD MORTIMER MUNDY, Treasurer Philadelphia Rubber Works. Died at Philadelphia, Pa., March 6, 1917.

FRANCIS CORNELIUS VAN DYK, President Sterling Tire Corp. Died at Paterson, N. J., May 21, 1917.

The secretary's report was received and placed on file.

Legislative Committee's Report

The report of the Legislative Committee of the Rubber Association was read by Frederic C. Hood, Hood Rubber Co., Watertown, Mass.

The Legislative Committee had had an interesting and active year. The War Revenue bill brought out many problems not the least of which was the proposed import tax on crude rubber. The Legislative Committee believed an excise tax on manufactured goods was much to be preferred to an import tax on crude rubber for many reasons, among them being that an excise tax would cost the Government less to collect; that the consumer could see a direct excise where he could not see an indirect import tax; that the contracts and export business would be less disturbed by an excise tax than by an import tax.

After consultation, the Legislative Committee had found that most firm members of the Rubber Association agreed with the committee's views, and the New York members secured the services of Martin W. Littleton, and with the cooperation of several firm members prepared briefs and facts and figures. An able presentation of the objections to the import tax was made to the Senate Finance Committee, and an excise tax on the rubber industry was urged if a tax was to be placed on every industry. The proposal of an import tax was dropped from the War Revenue Bill, and no excise tax was incorporated into it.

The Legislative Committee made it clear to both houses of the Federal Government that the rubber trade would cheerfully pay its fair *pro rata* share of war taxes, but always asked that the rubber industry should not be selected for special taxation of any kind, and that taxes should be assessed so that every industry in general should not be discriminated against, but that all business should be taxed equally, and that in no case should industry be taxed so as to make industry unprofitable, or so that the investing public would not be attracted to its securities.

The committee had also given special attention to so-called social legislation, including workmen's compensation, hours of labor, old age pensions, health insurance, unemployment insurance and other similar social problems. Facts and

statistics had been compiled and these were accessible to any firm members of the Rubber Association in the office of the National Industrial Conference Board. The committee expressed the hope that these compilations would assist legislators to make laws on social problems, based on facts rather than on theories and on oratory.

The committee had also interviewed the Tariff Commission regarding the revision of the Administrative Act of the Tariff Laws, and had accepted an invitation of this commission to make suggestions regarding other phases connected with the tariff.

Another feature of the committee's activities was the attention it had given to Patent Office practices, especially relating to trademark classifications. Many other small problems had been handled, such as the interpretation of the Child Labor Law requirements.

Mr. Hood asked to express his personal appreciation of the work of Messrs. Capt. H. Stuart Hotchkiss and George B. Hodgman, the New York members of the committee, and also the thought that the chairman of active committees should be men residing in or near New York.

The report of the Legislative Committee was duly accepted and filed.

Rubber and Kindred Products Committee

The next committee to receive the attention of the meeting was that on Rubber and Kindred Products. In the absence of Charles T. Wilson of Charles T. Wilson Co., chairman of the committee, an informal report was made by William J. Kelly of Poel & Kelly.

Mr. Kelly told of the change of the situation with regards to the importation of crude rubber. In December, the United States government took over the work of controlling imports of crude rubber, which prior to then had been under the supervision of the British government. Following this, the American government asked the Committee on Rubber and Kindred Products to step into practically the same position that they occupied with the British government, that is to say, have all the guarantees pass through their hands. The committee is now handling this work and has added to it another important occupation with regards to the importation of crude rubber.

At the present time all imports of crude rubber have practically to be O. K.'d by the Committee on Rubber and Kindred Products. The same is true regarding exports. Mr. Kelly said that the whole rubber industry of the United States revolves itself around the committee, so that the work of the committee has been very much enlarged from the time they started in two or three years ago.

The committee is going to be increased from six or seven to eight, in order to distribute the work properly and relieve the pressure on the individual members. Instead of holding fortnightly meetings, as heretofore, the committee, as a body, will meet weekly, and sub-committee meetings will be held every day. The committee wanted cooperation on the part of the members of the association in handling the many questions that come up in its task. If all would only look at all the things in a reasonable light, Mr. Kelly said, he felt that the committee would be able to work out all their difficulties for them without any great hardship on anyone.

Amendment to Constitution

At the request of Mr. Cartmell, chairman, the secretary read an amendment to the constitution of the association, of which notice has been given in the call for the meeting. The proposed amendment read as follows:

"*Resolved*, that Article IV, Section 1 of the Constitution and By-Laws of The Rubber Association of America, Inc., be amended by the insertion of the following at the end of the first sentence of said section 1:

"'The Directors to be elected at the annual meeting of 1918 to be divided into three classes to serve one, two and three years respectively and that thereafter all Directors be elected for three years.' Thus making the entire first sentence of Article IV, Section 1 read as follows:

"'The Board of Directors shall consist of twelve Firm Representatives who shall be elected at the annual meeting, the directors to be elected at the annual meeting of 1918 to be divided into three classes to serve one, two and three years respectively and that thereafter all Directors be elected for three years.'"

The proposed amendment was unanimously adopted.

Election of Directors

The secretary proceeded to read the list of nominations for directors for 1918, as follows:

FOR ONE YEAR

William E. Bruyn, L. Littlejohn & Co., New York.
Charles A. Daniel, Quaker City Rubber Co., Philadelphia, Pa.
John S. Lowman, Philadelphia Rubber Works Co., Akron, Ohio.
A. D. Thornton, Canadian Consolidated Rubber Co., Limited, Montreal, P. Q., Canada.

FOR TWO YEARS

H. Stuart Hotchkiss, United States Rubber Co. System, New York.
Charles T. Wilson, Charles T. Wilson Co., Inc., New York.
John A. Lambert, Acme Rubber Manufacturing Co., Trenton, N. J.
Paul W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio.

FOR THREE YEARS

Bertram G. Work, The B. F. Goodrich Co., Akron, Ohio.
Harry T. Dunn, Fisk Rubber Co., Chicopee Falls, Mass.
Charles J. Davol, Davol Rubber Co., Providence, R. I.
William J. Kelly, Poel & Kelly, New York.

The above directors nominated by the Nomination Committee, which had been chosen with a view to securing representation from the different branches of the rubber industry, as well as from the various rubber manufacturing districts, were unanimously elected.

Telegrams

There being no unfinished business to be considered, the secretary, at the request of the chairman, read telegrams of regret that had been received from Sir Richard Crawford, British Embassy, Washington, D. C.; J. J. Broderick, of the same embassy; Charles S. Whitman, Governor of the State of New York, and Colonel Charles Clifton, of the Pierce-Arrow Motor Car Co., Buffalo, N. Y.

Vote of Thanks for Mr. Firestone

William J. Kelly of Poel & Kelly, New York, suggested a vote of thanks for Harvey S. Firestone, retiring president of the association. This motion was seconded and unanimously carried.

At this juncture Charles T. Wilson, chairman of the Committee on Rubber and Kindred Products, appeared at the meeting and George B. Hodgman, Hodgman Rubber Co., Tuckahoe, N. Y., second vice-president of the Rubber Association, moved that opportunity be given him to supplement Mr. Kelly's informal report on this committee, if he wished to do so. Mr. Wilson stated that he had nothing to add to what Mr. Kelly had said.

There being no other business requiring attention, Van H. Cartmell, chairman, called for a meeting of the newly elected directors to take place immediately in the East Room of the Waldorf-Astoria, for the purpose of organizing. He then moved to adjourn the annual meeting, and his motion was adopted without discussion.

Meeting of the Directors

The newly elected directors met immediately after the adjournment of the annual meeting and elected the following officers:

BERTRAM G. WORK, *President.*
CAPT. H. STUART HOTCHKISS, *First Vice-President.*
HARRY T. DUNN, *Second Vice-President.*

THE EXECUTIVE COMMITTEE

BERTRAM G. WORK, *Chairman.*
HARVEY S. FIRESTONE, *Vice-Chairman.*
CAPT. H. STUART HOTCHKISS.
HARRY T. DUNN.
PAUL W. LITCHFIELD.
WILLIAM J. KELLY.

The Eighteenth Anniversary Banquet of the Rubber Association

The eighteenth anniversary banquet of the Rubber Association, which was held in the grand ball room of the Waldorf-Astoria Hotel on the evening of Jan. 7, following the annual meeting of the association and of the various divisions of that organization, was characterized by a marked spirit of cordiality, optimism and goodwill.

It was preceded by an informal reception in the Astor gallery where hundreds of men prominent in the rubber industry enjoyed a pleasant social hour. Cordiality reigned, old acquaintances were renewed and former friends reunited. The reception was happily conducted under the auspices of the Reception Committee, consisting of A. H. Brown, chairman; George E. Hall, Thomas M. Gardner, H. Stuart Hotchkiss (absent on military duty), Theron R. Palmer, George B. Dryden, Charles J. Davol, J. Western, H. G. Fisk, W. O. Rutherford, J. T. Johnstone, Seneca G. Lewis, J. W. Thomas, W. E. Barker, Otis R. Cook, E. J. Stokes, George B. Hodgman, Guy Norwood, G. A. Ludington and J. H. Kelly.

At the sound of a bugle, the members and guests slowly moved into the grand ball room which had been tastefully decorated with flags and banners for the occasion and where seventy-six tables had been made attractive with flowers and greens. The entire arrangements for the banquet were in the hands of the Banquet Committee composed of William T. Cole, chairman, Francis R. Henderson and Tracy S. Lewis, and in every quarter words of praise were heard of the success that crowned their work.

Seated at the President's table were:

FREDERIC C. HOOD, vice president and general manager of the Hood Rubber Co., Watertown, Mass.

JAMES A. EMERY, general counsel, National Council for Industrial Defense, Washington, D. C.

VAN H. CARTMELL, president, Kelly-Springfield Tire Co., New York.

WM. T. COLE, president, Fabric Fire Hose Co., New York.

JOHN J. VOORHEES, president, Voorhees Rubber Manufacturing Co., Jersey City, N. J.

Col. SAMUEL P. COLT, president, United States Rubber Co. System, New York.

FRANK A. VANDERLIP, president, National City Bank, New York.

BERTRAM G. WORK, *toastmaster*, president, The B. F. Goodrich Co., Akron, O.

RIGHT REVEREND FRANK DU MOULIN, Bishop of Ohio, Toledo, Ohio.

GEORGE G. HODGMAN, president, Hodgman Rubber Co., Tuckahoe, N. Y.

BRIG.-GEN. ELI D. HOYLE, U. S. A., Department of the East, Governor's Island, New York.

FREDERICK B. PETERSON, Director of the Bureau of Imports, War Trade Board, Washington, D. C.

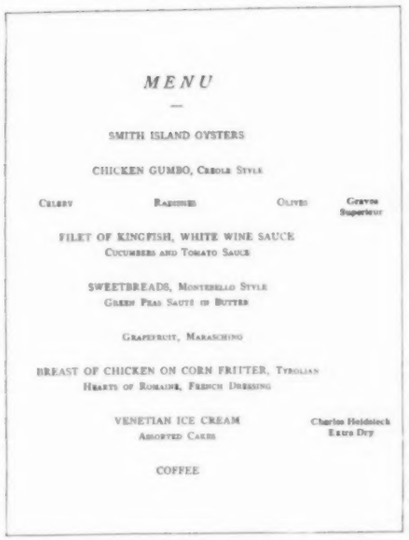
CHARLES T. WILSON, president, Charles T. Wilson Co., New York.

C. CLIVE BAYLEY, H. B. M., Consul General, New York.

W. A. SMART, H. B. M., Vice-Consul, New York.

HON. A. O. BOURN, president, Bourn Rubber Co., Providence, R. I., former governor of Rhode Island.

When all had found their places with the assistance of the printed list of guests and their table numbers—there were 752 diners by exact count—all stood at attention while the orchestra played the National anthem.



MENU

SMITH ISLAND OYSTERS

CHICKEN GUMBO, CREOLE STYLE

CELERY RADISHES OLIVES Graves Superieur

FILET OF KINGFISH, WHITE WINE SAUCE
CUCUMBERS AND TOMATO SAUCE

SWEETBREADS, MONTEBELLO STYLE
GREEN PEAS SAUTÉ IN BUTTER

GRAPEFRUIT, MARASCHINO

BREAST OF CHICKEN ON CORN FRITTER, TYROLIAN
HEARTS OF ROMAINE, FRENCH DRESSING

VENETIAN ICE CREAM Charles Heidsieck Extra Dry
ASSORTED CAKES

COFFEE

The newly elected president of the Association, Bertram G. Work, who served as toastmaster due to the inability of the retiring president, Harvey S. Firestone, to be present, rapped for order and the Right Reverend Frank Du Moulin, Bishop-Coadjutor of Ohio, pronounced a brief invocation.

All enjoyed the delicious dinner which was exceptionally well served, and many old friends renewed old relations around the festal board.

After the dinner, President Bertram G. Work, who officiated as toastmaster arose and proposed a toast to the President of the United States. This was greeted with applause, while the band played "The Star Spangled Banner." He then proposed a toast to the King of England, and the band played "God Save the King." He then proposed a toast to the President of the Republic of France, and the band played the "Marseillaise." He then proposed a toast to the King of Italy, and the band played the Italian National Air. He then proposed a toast to the King of the Belgians, and the band played "La Brabaconne." These toasts were all drunk and made loud applause.

A member then proposed a toast to the new President, which was greeted with enthusiastic and hearty applause.

President Work then said:

I thank you, gentlemen. As you all know, it has been the custom in the past for the retiring president to preside at the annual banquet. Mr. Firestone is unable to be here this evening; I will read a telegram received from him today which will explain his absence:

With an earnest endeavor to get in prime condition, I accepted loyally the most disagreeable doctor's prescriptions. Despite this, I find I am prevented from having the great pleasure of presenting the President's report and presiding at the annual dinner. Please convey to the officers, directors, committees and members my sincere appreciation of the interest and support given the Association the past two years, and wish all the same happy, congenial time we had at last year's dinner. It is a matter of keen regret that I cannot be with you.

The duty, therefore, falls upon the in-

THE SOUVENIR MENU

coming President. I happen to be that individual. Mr. Firestone had prepared his annual report, and I will read it to you as coming from him:

As President of the Rubber Association of America during the past year, the most momentous in the history of the country as well as our industry, I want to thank the committeemen and all our members for the hearty support and assistance they have given your directors. For the benefit of you who have not been able to follow the business activities of our Association, I should like to speak briefly of the events of the past year.

The entrance of our country into the great war in Europe has placed great responsibilities upon our Association. Our activities have been largely concerned with the carrying out of the details of the military rubber guarantees, as in the past two years. With the severances of relations with Germany, our Association offered the services unreservedly to our Government to perform any duties which it might wish to entrust to us.

This offer was gladly received by the Department of Commerce, which, several weeks after war was declared, approached the Rubber Association to negotiate plans for controlling the import and export of crude rubber and rubber goods. These negotiations have culminated in the arrangement, with which the trade is now familiar, by which all crude rubber arriving in the United States is consigned to the Rubber Association of America and the Association is entrusted with supervising its distribution under auspices of the War Trade Board at Washington.

This has resulted in greatly increasing the sphere of activities of the Association and necessitated the opening of offices in Washington, San Francisco and Seattle. It will also, doubtless, be necessary to maintain agents at other ports of entry, particularly as the British Government has transferred its work in connection with rubber control to the War Trade Board of the United States, in cooperation with whom the Association is now working. On behalf of the Association this work is being handled by the Committee on Rubber and Kindred Products, formerly known as the Rubber Advisory Committee.

The broadening of the scope of the activities of the Rubber Association has been accompanied by the largest increase in membership in any one year. Last year, our total firm membership numbered two hundred and thirty-one. There are now three hundred and fifteen enrolled so that at the present time it may be safe to say that all the important interests in the rubber trade and its allied industries are now comprised within the firm membership.

As the various groups of the industry are now well represented by the divisions organized prior to this year, no new divisions have been added. During the past year, the Arbitration Committee that was provided for at our annual meeting has been appointed and organized, and rules and regulations for the conduct of arbitrations have been adopted.

Our social events have been modified during this year owing to the war. Our midsummer outing was given up, and the funds usually expended for this purpose, donated to the Red Cross. A golf tournament was held at the Trenton Country Club on Oct. 16. It was a most enjoyable event, thanks to the hospitality of our New Jersey members. The Association was well represented, and incidentally a substantial contribution was made to the New York *Sun* Smoking Fund for our soldiers in France.

In retiring as President of your Association, I wish to thank you for the honor you have conferred upon me, and I desire again to express my appreciation of the hearty co-operation I have received from the members of committees who have worked hard and faithfully to make the Rubber Association of America one of the largest and strongest trade organizations of the country.

THE CHAIRMAN: We expected to have with us tonight the Secretary of War. I will read you a telegram received from him:

It is a matter of keen regret to me that I find it impossible to be present at the meeting of the Rubber Association of America. It would mean for me both a visit to what is still "home" and it would enable me to meet the company of men who will be gathered with you in the furthering of an industry which however important it was in *ante bellum* times has now increased its significance to us manyfold.

Those who saw the Battle of the Marne won through the use of motor vehicles or those who have viewed the increasing anxiety of the people of the Central Empires to secure rubber and its products cannot fail to be impressed with the necessity of this material in our war preparations and transactions.

The very large number of standardized army trucks, the many balloons, the huge consignments of waterproof clothing, the requirements of the surgeons for ministering to the wounded, all cause us to urge your Association even further to extend and invigorate its operations. I am grateful to you for the opportunity which was offered to be with you, and I heartily wish that conditions here would have permitted me to avail myself of the invitation.

Cordially yours,
NEWTON D. BAKER,
Secretary of War.

Frank A. Vanderlip Speaks on War Problems

In introducing the first speaker, Frank A. Vanderlip, president of the National City Bank, whose illness prevented his speaking at last year's meeting, Mr. Work said that the association should be congratulated at having him accept the association's invitation to be present, particularly because of the very prominent part that Mr. Vanderlip is playing in the welfare of the country at this time. He is devoting nearly all of his time to public affairs; he helped to make the enormous war loan possible; he has delivered a strong message on economy to the country, and he is familiar with our great problems. In his powerful position, he has done much to encourage the rubber industry. Mr. Vanderlip said:

Today we are starting on the tenth month of the war. Nine months ago yesterday it was declared that we were in a state of war. We have done a great deal; we have learned a great deal; and one of the things—perhaps the most important thing that we have to learn, next to the causes, the principles for which we are fighting, is the size of the effort involved in this great task.

We are only just coming to understand what an enormous task we have entered on. We have seen it measured in dollars; we have seen appropriations aggregating nearly twenty billions, appropriations that are expected to be spent, or were expected to be spent when they were made. We have seen contracts made for these huge amounts; and we are beginning to discover that appropriations, that treasury credits will not successfully fight a war.

We are waking up to the character of this war,—that it is a war of equipment, a war of the workshops, a war in which men are, of course, essential,—soldiers of valor; but without the equipment, without the enormous amount of things that are needed, these soldiers cannot face Prussian militarism. And we are just beginning to recognize how vast a task the workshops, the man-power of the country is facing.

Now as we come to grasp that, as we come to see the relation between the total amount of shop production that is required for this equipment and the total capacity of our production, we are beginning to see more and more clearly that something is needed besides treasury credit. It is possible to make contracts, it is possible to provide the funds to pay, but we have so far found it impossible to provide the things with the rapidity with which we need them, with the rapidity with which the world needs us to have them, and there is disappointment.

PERSONAL SACRIFICE DEMANDED

Now, what is the matter? The trouble is that as we come to see how great the task is, we have not yet seen our individual relation to it. We are only just beginning to wake up to the fact that the man-power and the shop capacity of this country is not equal to this task, if there is to be laid on it also the task of providing us with all the things of comfort and luxury that we have been used to having. We are coming to see that we have got to measure our individual conduct, our individual expenditures, in an entirely new light; that it is no longer a question of what a man can afford to buy, it has come to be a question of what the Nation can afford to have us buy.

Nineteen billion dollars worth of manufactured things is a total so huge that the people who are engaged in providing those things have hardly realized its extent. Three years ago there was a canvass made by the Census Department, of the value of all manufactured things in the country, and that year the total value of the entire product of our shops was less than twenty-five billion dollars.

Now, there has been a great increase in our capacity, prices are higher, the measure of workshop capacity today would be very much beyond that figure, but at whatever point you put it, when you come to put in juxtaposition the figure of nineteen billion dollars' worth of things, you will see that we are making a demand upon our capacity that can only be met if the whole people recognize their individual responsibility and forego their command upon things, that command which lies in their hands in an increasing degree as the vast wage fund grows and grows to the highest point we have ever known.

The envelopes paid out last Saturday night held more money than pay envelopes had ever held before. The workmen never had such capacity to buy; the crop of the country was worth this year twenty-one billion dollars compared with the crop value of nine billion dollars the year before the great war started. We have a buying capacity such as we have never known. It is being exercised, and it is being exercised in competition with the Government.

Just from our prosperity we have been giving a command of things into innumerable hands, so great that we have been tampering with the equipment of the Army; we have slowed it down; we are not producing that equipment with anything like the rapidity with which we expected to produce it.

The Government expected to expend a billion dollars in October, one billion one hundred million in November, and as much or more than that in December. As a matter of fact, in those three months they have averaged to spend only half that amount, not because they have not let the contracts, not because they did not have the money to pay for it, but because the man-power in the shops of the country could not produce things at the rate that was anticipated, and have kept on producing the things that you and I have demanded.

GOODS AND SERVICES

England has learned that lesson, has learned this doctrine of goods and services,—that it is goods and services that the Government needs, and that money alone will not buy those goods and services if individuals are in competition with the Government. That is the philosophy of this war-savings movement; it is the philosophy of the war itself. It is the philosophy that must lie back of any future issues of Liberty Bonds.

I have no fear at all that the treasury can be provided with sufficient credit. The Government has got a first mortgage on this country, and our wealth is quite sufficient to warrant the belief that the treasury can raise the credits. Our experience in producing the things leads me to believe that we are going to make a failure of equipping this army unless the people of this country recognize their individual responsibility.

I heard today a comparison that appealed to me, comparing this army to a spear, the men the metal head of that spear; the equipment the great shaft. You know that shaft extends clear across this country. Everyone of us has got hold of it, and we are either going to push or we are going to pull, and it is the resultant of those forces, it is the sum total of the push, and the push that has got to come from a hundred million people, that is going to determine the strength of the blow that we will strike.

Let me tell you we have all got hold of that spear, whether we will or not, and we are all going to pull or push. There is a draft which has taken in every one of us. We have all been drafted into this army which is back of the army in khaki. We have been drafted and we must play our part, and we have not yet awakened fully to the responsibility of that part. We have not yet understood that the success of our soldiers depends not upon their valor alone. Of that there is no question. But it depends on how united the people of this country are in the support of that army.

THE RESPONSIBILITY OF ECONOMY

This doctrine of economy is not a pleasant one to preach. It is not one that is listened to with a great deal of patience. You will hear a great many people say that we must have a background of good business; that it will be impossible to finance this war without a background of good business. We are going to have a background of good business. There is not any question of that, but if we push this war to a successful conclusion, it is going to be a very different business. It is going to be the business of war that we are all to engage in, and in the measure in which we do engage in it we will find the army equipped ready to be forceful on the fields of France. And in the measure in which we get in the way, in the measure in which we unconsciously tamper with this equipment, we will hold back the day of success and we will increase the number of men who will never come home on the day of victory.

We have a responsibility upon us such as we have never as a nation recognized before. Indeed, that is one of the good by-products of the war, that we are all going to recognize more clearly the responsibilities of citizenship, the fact that society is a unity, and that we all must play our part in the light of our duty to society. If we learn that lesson, if we learn this lesson of the responsibility of citizenship, we will have accomplished something that will be almost comparable with winning the war itself.

There are men who are afraid that we are going to disorganize business if we preach economy. The tragedy of it is going to be that we are not going to disorganize cer-

tain kinds of business enough. In a period of such tremendous prosperity, in a time when the wage found is so great, when the profits of agriculture are so tremendous, it is going to be impossible to take this lesson of economy with one hundred per cent efficiency to one hundred million people. What I fear is, that we will have the greatest business in luxuries we have ever known, that people will unconsciously exercise their command over labor, over material, over shop-room and transportation, and will interfere with outfitting this army.

TRANSPORTATION BREAKDOWN NO INDICTMENT OF PRIVATE OWNERSHIP

The breakdown of transportation has been in large part a result of our very prosperity, in large part the result of the enormous amount of shipments that have been made possible, made necessary, by the prosperity of the country and the demand that people have made for things of unusual comfort and luxury. I do not regard the breakdown of the railroads as an indictment of private ownership of railroads. Rather than that, it is an indictment of Government control of railroad in the form that we have had it.

The breakdown did not come on the 28th of December; it started far back of that, in the unfair treatment that railroads have had. It lies in the impossible situation in which the railroads were placed, with increasing costs of operation, rapidly increasing wages, higher cost of living in every particular, without any adequate increase in their income. It looks as if the railroads have passed permanently from private control in the form that we have known it. Whether or not that is a good thing must now remain to be seen.

The great thing that has been accomplished up to this moment is to wipe out the prohibitions that have been laid upon the railroads. These prohibitions, compelling competition, preventing co-operation, made them less efficient than they otherwise would have been, probably very much less efficient. We shall see how much more efficient they are with those prohibitions removed. If they were such that the railroads could not properly perform their duty to the public, that is not an indictment to the railroads, rather it is an indictment of the way the prohibitions were laid upon them.

STATE SOCIALISM

We have come into a new world, absolutely a new world, in which we have cut loose from experience, from all lessons of precedents, we are seeing the development of a type of state socialism the world over. We see now not only our railroad control, but price fixing, and fuel administration, with the hand of the Government reaching into business in innumerable novel ways, the outcome of which no man can tell. But, certainly this new world, these new conditions, impose upon us new responsibilities, for creating sound public opinion on these matters.

You no longer can devote yourselves properly solely to your business. There is before you a larger duty, a duty to think clearly on these great National questions, novel in character, that are crowding upon us. Nothing but a sound public opinion is going to guide this country through these novel and dangerous courses that it must travel; and never before was there such need of men thinking broadly, giving their minds not only to their business, but to these subjects of government, of government relation to business, and helping to form a sound public opinion that will guide the handling of affairs in these times into which we can look with so little certainty.

WAR-SAVINGS MOVEMENT

I want to speak just a word about this war-savings movement. I am told that the people here employ 400,000 men. That means that a great responsibility lies on you. I believe, looked at just selfishly, just from the point of view of the future of your business, that you owe it to yourselves to understand this movement for gathering together the savings of people in small amounts, of bringing to the support of the Government, a vast army of new investors, of having thirty million stockholders in the United States—which is the thing I am thinking to accomplish, of having thirty million new savers, thirty million people who will be financially interested in this country, and who will be laying by something for the rainy day that may come,—and it may be a very rainy day.

If your employes, the our hundred thousand men who are working for the corporations represented in this room, are brought to a patriotic cooperation with the Government, it will be a great influence for the future. If they are brought to regard economy as a means by which they can help to win this war, if they are brought to lay by so that they have got some stake, they will be better employes; they will be better citizens, and the future of the country will be more secure as will the future of your business.

I believe there is not a man here who cannot well afford from the point of view only of his corporation, to thoroughly understand this movement, to forward it to the fullest extent of his ability, with the army of employes which you represent. It is this idea of the individual responsibility for the winning of the war that we must get into the minds of all of us. And you have your responsibility to see that that idea is carried on, that people grasp it, that they feel that this propaganda of economy is not a doleful affair. Rather that it is an opportunity.

Men everywhere are patriotic, men everywhere are looking for the opportunity to help, something to get hold of to help in this gigantic struggle. Now, here is the opportunity. It lies clearly before us. And you can carry that idea to a multitude of men. And it is your duty, it is your responsibility, it is your greater opportunity to see that men regard this as their opportunity to help.

We would all be in this fight if we could, but I tell you if you cannot go you must see that you must forego. You must see that you must help in this work of making room in workshops, of releasing labor, of making it possible for this Government to so equip the army that it will be an effective instrument to break down Prussian militarism.

FRANK A. VANDERLIP
Photo by Altman

is closely associated with the largest manufactures of this country, and spends a large part of his time in Washington, where he has come in close contact with national affairs. He said in part:

I arrived on a somewhat delayed but Government-controlled train from Washington today feeling somewhat like the gentleman who lived on the Erie in New Jersey—who got stuck in a snow drift, and finding he could not reach home, telegraphed his office saying, "Will not be down today. Not home yesterday yet."

This is a far different world from that which Napoleon engulfed in war. Europe was then a great body of independent self-supporting agricultural states. The development and miraculous expansion of industry has made it in our day a great body of industrially and economically interdependent states, each supporting upon its own soil a population far greater than its supply of food can take care of, and which it maintains only by the interchange of its surplus commodities for the things it needs, and that renders it at once powerful and vulnerable, for each state must steadily maintain not only its place in foreign markets, but it must maintain its line of communication with them, for the moment it ceases to be able to dispose of its surplus production, it finds its surplus population without means of employment and support, and is faced with the discontent and social unrest that follow want.

In that condition is to be found no little of the causes that led to this great struggle—the apprehensions and fears, the rivalries and the discontents and jealousies that sprung out of the rivalries for the market places of mankind; but they long since have been lost in the greater issues that have been presented by the circumstances of this conflict.

How difficult it is to adjust ourselves to the circumstances of such a struggle! We are still thinking in terms of peace, when engulfed in the midst of a war that has torn down mankind's most fixed institutions.

It seems as though the very paradox of condition was illustrated by Daniel O'Connell's description of the difficulties that confronted

Support Pledged

Mr. Vanderlip's address was followed by long applause after which William A. Perrett, of the Republic Rubber Co., moved that a telegram be sent to President Wilson assuring him of the United support of the Rubber Association of America and of the united efforts in support of his stupendous undertaking. This resolution was unanimously adopted.

James A. Emery Speaks on "Industrial Production in the War"

The toastmaster then introduced James A. Emery, the general counsel for the National Council for Industrial Defence, who

the Common Council of Clare, when it undertook, in his day, to build a new jail and expressed its intention in three resolutions:

"*Resolved*, That the county do build a new jail; and *Resolved*, That it build it from the materials of the old jail, and *Resolved*, That the prisoners be confined in the old jail till the new jail is completed."

It is difficult to see our own relation to the circumstances of a conflict that requires so much from each individual, so that while we are most remote the very nature of our effort may have in its own small way an intimate effect upon the effort of the whole. Our relationship is like that of the tailor who put the sign of an apple over his door, and when the inquisitive inquired as to the relationship of his sign to his business, he said: "Did you ever stop to think of what would happen to the tailor business if it had not been for the apple?"

A WAR OF INDUSTRIAL PRODUCTION

This is a contest in which the sum of individual effort is to fix the blow of the whole. Because we fight our war in terms of the world in which we live, and we live in an industrial world in which our powers of construction once turned to destruction illustrate possibilities of devastation which no man had conceived. This is not a contest in which mere man-power can win, in which mere superiority of wealth can win, in which mere numbers can win, in which even powers of production alone can win, but it is a struggle of competitive efficiency in production in which the nation that possesses the ability to drive at the focal point of all the resources of production and wealth can win if it strikes the vital blow. It is a battle in which the non-industrial nation is hopelessly outclassed.

Russia possessed twice the man-power of Germany, but Russia possessed neither the means of supplying her necessities of industry, nor distributing them by transportation. Before she became a universal debating society, she had twice penetrated into Germany territory but was unable to maintain her advance because she could neither supply herself with the means of supporting her far-flung battle lines, nor could she distribute the supplies which she received from her allies.

This to an extent, never known before in the history of man, is a competition in efficiency of production and distribution. Other battles and wars have been fought by a standing army, but this is a contest that calls into the struggle the man-power of an entire nation.

There is a new literature born from this war, the literature of those thousands of fine minds that abandoned their business and their profession, that deserted their ease and their affluence, that left humble homes and great ones because they felt that this was a crusade, and that no man capable of rendering service could refrain from giving it. It will be a war, said Conningsby Dawson, writing from his hut in the battlefield on the Somme, a war that will be won by tired men who never again will pass an insurance risk.

COMPETITIONS BETWEEN INDUSTRIAL SYSTEMS

But it is not a mere contest of soldiery nor of strategy nor of tactics, nor of the superiority of armies in the field. That far-flung battle line is but the periphery of a gigantic competition between industrial systems and management and man, in the production and supply of the means of destruction, because the fundamental wealth of a nation rests in its capacity to produce in this day; not alone to produce, but its capacity to efficiently organize the means of production which it supplies, until it has provided upon its battle line a means of destruction so much superior to its enemy that by the very loss of his man power he is beaten to his knees and surrenders.

It is a battle fought not merely by men in trenches, but by men in factories, on farms, in forest and in mine, who, like the bucket brigade at the village fire, are hurrying forward the only means by which the conflagration can be suppressed. It is a contest of mechanics in the uniform of privates, of managers wearing the stars of generals, each guiding the complex and gigantic machinery of the most tremendous means of destruction that mankind has ever experienced.

Why, gentlemen, if we stop to realize what it means to equip ten and fifteen millions of men in arms, to maintain the continuous flow of supplies which alone enables them to sustain their strength and point their gun, then we begin to realize that the loss of a factory may be as important as the destruction of a division, and that we are limited in this country particularly, though our effort at production should be the most efficient we have ever known, if we lose the means by which to put the fruit of our farm and of our factory on the fighting line.

We must bridge an ocean with boats, for without them no matter what we produce, we are limited if the ocean cannot be passed. The lanes of the sea must be free, and we must maintain the longest battle line ever known in military history, not only the distance between where the American soldier stands in his trench and the water base from which his supplies shall flow, but to keep it free from the submarine thug that undertakes to write "Verboten" over the long three thousand miles of ocean.

PRODUCTION IS THE VITAL POINT

The condition under which a struggle, a competition in production, becomes the vital point of war. Under such a condition it must become obvious that he who serves the purposes of war in factory and farm, in forest and mine, whether he distributes it by sea or by land, is no less the soldier of his country, fighting its fight and doing his bit toward the winning of the war, than he who points a rifle in the trench, for, unless that man in the trench can be supplied and his rifle loaded, it cannot be fired.

John Bouquin, in his first official history of the Battle of the Somme, tells us that in the preliminary light artillery bombardment of five days that preceded the British attack, and in the heavy artillery bombardment of three days which preceded it, that the expenditure of artillery ammunition was equal to the first eleven months of the British production. No wonder, under circumstances like that, that we find the present Premier of Great Britain appealing to his fellow countrymen at the British Trade Union Congress on Christmas night, 1915, in words like this:

"Either we must tell the soldiers that we are sorry we cannot get the guns to enable them to win through 1916, owing to trade union regulations, or we must tell them that if they manage to hold out for another year, perhaps American workmen will help us get a sufficient supply for 1917. I cannot return to Parliament and report through the House of Commons to the British Army that skilled workmen will not suspend their rules to save their fellow-countrymen's lives on the battlefield."

INEFFICIENCY SPELLS DEFEAT

Do you realize—does the world realize now that efficient production is victory and inefficient production is defeat—that the desertion of a factory may be as serious as the desertion of a trench? And if there are to be desertion of factories, let it be seen, gentlemen, that you are not responsible for it, that no example of yours that takes advantage of your country in time of need or your countrymen in time of stress, sets an invitation for undue charges that may be carried by those you employ.

Yours is the business of great example, and as you deal justly, so you may expect men by your example to deal justly with others. A man who takes advantage of his government in this hour, be he the head of a corporation or the labor union official at the head of his organization, is equally the enemy of their common cause; and whatever his motive may be, he who causes a suspension of production at this time performs the work of the public enemy.

In a contest in which victory must be won by things which are produced and placed at the service of those who lead our armies and guide our ships—in a time when our factories are called upon to produce as they never have produced before, and when our fields must not only feed our own people, but must feed the hungry and the starving of the devastated nations of ruined Europe, every waste of food, every waste of money, every waste of effort, is depriving those who fight the world's battle for liberty of the means with which to carry banners on to victory.

MUST RECOGNIZE CONDITIONS

We are not less in a service that calls all its man power into the struggle, because we fight at our desk or in our business place, or in our bank, or in our store, to support him who risks his life on the further flung battle line and endures the hardship and horrors of the fields of France.

We are facing a condition in this country which we must frankly meet and recognize. That we not only have been, but are threatened with continuous interruptions of production of the most serious character, and when we realize, as Mr. Vanderlip has so strongly told you, that all the ghostly fingers of the machinery of civilization are insufficient to meet the tremendous expenditures of this war, then we begin to realize that every day lost, every bit of production, that fails or stops makes longer and more bitter the struggle, and as more surely adds to those dead faces that from the French fields look tonight up against that starry winter sky.

GREAT LOSSES CAUSED BY STRIKES

Yet since this war began, here in the tenth month, production has been interrupted by the deliberate and concerted cessation of work here in these United States with the loss of a greater number of work days than in the period that preceded our entrance into the war.

Munition factories producing machine guns, ordnance and all the supplies for the equipment of our army, have been stopped in the processes of production for days at a time. The copper mines of the Southwest yielding over thirty million pounds of copper per month did not, for more than two months, yield a single pound, when the world cried for copper, because men could not adjust their differences except by a competition in waste.

The making of steel, the mining of coal, the hewing of timbers for ships, all have been halted and halted for long periods, by the arbitrary and capricious demands of individuals and organizations.

I have just come from the Pacific Coast, where I saw standing in the shipyards of San Francisco a vessel builded, with its sister ship, for no other purpose than to transport the ship timbers and materials that were required along the Pacific Coast for building fourteen vessels for the Government; and that ship, or its hull, stood at the Union Iron Works, which had erected and was under contract to install its machinery, for four months, exactly three months longer than was needed to complete the task, because the hull had been builded by non-union men, and union men would not install in it the machinery necessary to operate it.

COAL MINERS' INCREASES

An agreement was made in Washington and became effective on Oct. 29, by which the United Mine Workers agreed to a condition that demonstrates a most remarkable restriction of production. The Fuel Administrator, in his communication to the President, calls attention to resolutions adopted which declared that the very life of the organization was at stake because of the failure of its members to keep agreements for production, and declared that in the deliberate judgment of the representatives of the organization, if men would remain at work five days in each week of eight hours apiece, they would produce sufficient coal for the national need; and the forty-five cent increase which the Government has allowed at the mouth of the mine to the coal operator is predicated upon the condition that he will enforce penalties against every man who does not fulfill his agreement to give that length of work in the production of coal.

I know that between July 28 and Sept. 12 the caterpillar tractors that lie at the very foundation of the motor transport of a modern army, that were the foundation of the tanks that broke the line at Cambrai and turned the Hindenburg retreat almost into a rout, were stopped by the arbitrary demand of a body of men who would neither work themselves nor permit others to work; and 200 in number of these men performed in the front of that sole factory in America where caterpillar tractors were made for the Allies and for our own Government, the functions that could have been performed only by a German regiment standing between that production and the Government.

A MILLION WORK DAYS LOST IN SEPTEMBER

The Bureau of Labor Statistics in the December number of its issue, tells that with the last figures which it obtained during the month of September, 1917, there were 283 strikes in that month, and that they estimate that there were at least 450, the remainder being unreported; and that in 171 of those strikes for which figures are supplied, 147,000 men were idle for an average at a minimum of 7-1/3 days; and that means, if you multiply the number of men—and it is a minimum number; 119 strikes are not reported in their detail, and of the remaining difference between that and 450 estimated there is no information; but taking those which are reported, from a source whose authority will be undisputed, we find that in that month alone there were over a million work days lost, when the world cries for the fruits of production.

The official representative of the Shipping Board tells the Senate Investigating Committee that in the construction of vessels within their experience there have been 540,000 work days lost, equivalent to the production of 20,000 men in one month. And in the very same volume that gives us this information, we find the official German statistics, taken from the *Bremer Zeitung*, which tells us that in the whole German Empire in the year 1916 there was not one-fourth the number of strikes in the whole year that are reported as occurring on that minimum estimate in the United States in the one month of September, 1917.

EFFICIENT COOPERATION NEEDED

This, gentlemen, quite apart from the effective restrictions on production that come of any arbitrary demarkation of the work, that prevent the employment of unskilled labor of handy men, and reserve skilled labor to the function which it can alone perform. Now, I do not say these things to indict and attack. I say them because they are a condition that must be faced, unless, like the Spartan fool we hired beneath our garment the fox that bites at our vitals, and deny its existence. I say this because I believe the working men of this country are just as patriotic as their employers, but because we by example, or by precept, and by appeal, must beg and exhort them in this hour to realize that upon the joint labor of the employer and the employed depends the success of the war.

America can do her duty and fulfill her mission in this great hour only by the most

perfect and efficient cooperation between those who work and those who manage, between those who earn and those who spend; between those who govern and those who are governed. This is an hour when we must demonstrate to the world, if we are to demonstrate it at all, not merely that we can enunciate great principles of Government, but that in the peril of war we can defend and perpetuate them under the practical circumstances of National self-defense. If a democracy—this democracy—cannot efficiently defend itself by producing the means wherewith to save a world on fire, then, indeed, are our institutions a failure.

CONDITIONS TO BE MET

They are conditions to be met, and the quicker that we realize that they are here, the more quickly we will organize mind and body to meet them with firmness and with fairness, not only seeking justice, but giving it, not only demanding rights, but recognizing duties, and as the social structure realizes that men like you have achieved your success by superior ability and better advantage of opportunity, so upon us rests the obligation to be the first to recognize our duties by the justice of our treatment to those who labor with us, and our attitude toward the Government of which we are a part, supply the example by which we may shoulder to shoulder jointly move on to common victory.

Some say we should not speak of these things. Gentlemen, I believe that when a thing has reached a point that it should not be discussed, that is the hour to talk about it. It is no cause for discouragement. A nation whose history holds Valley Forge and the bleeding footsteps of its soldiers, a nation who had its Lexington that it might have its Yorktown, a nation whose martyred President wrote the memorandum of his defeat and pledged himself to the cause of the Union when he believed that he was to be succeeded by another whose heart was not in the prosecution of the Civil War, but who lifted his head in the proud face of victory to save the Union and die in its cause, that nation's power and purpose is not to be lessened by facing the difficulties and circumstances of this hour in the light of its own great traditions and principles.

WINNING AT THE MARNE

The present Chief Justice of the United States sat opposite Marshal Joffre at the White House dinner, and in the course of their conversation, between those distinguished old soldiers, for the Chief Justice served the Confederacy for three long years,—he said, "When did you make up your mind that you would win the battle of the Marne?" and the great Joffre replied, "When I received the dispatch from Petain in which he said, 'My right is in disorder, my left is destroyed, my center is pierced, I charge in fifteen minutes.'"

"Ah," he said, "When a man like that was ready to advance, I knew nothing could defeat us."

Nothing can defeat us if we stand in this holy hour securely attached to the great fundamental principles that have made us what we are, and that in war and peace must be our guiding star. For we shall win no war, nor any permanent place in mankind's history, if we win it by compromise of our principles. This is an hour when we are calling every citizen to service, and when no man and no organization can discriminate against the patriotic service in the factory or in the army of any American who is ready to serve. We are all alike beneath the flag.

A CRUCIAL HOUR

This is a great hour in which we live, a great occasion to dedicate ourselves, whether we serve with our body or whether we serve with our hand and mind.

The temporary socialisms of an hour and the controls of Government to perform the work of defense for us will only demonstrate, as it has already demonstrated in part, that in an age in which we are passing from enforced competition to regulated cooperation, you can't save a nation without permitting the coordination of human effort, and that in the coordination of that effort we cannot suppress the individual, we cannot make him a wave in the sea of socialistic effort; but we must depend upon the individual as we have depended on him always—by his character, by his ability, by his force, by his courage, by his self-sacrifice, to do his part toward the upbuilding of the nation, and in securing reward for himself to make his contribution to the society of which he is a part.

That we have demonstrated to be the value of individual effort, economical and moral. And, if we keep those great principles clear, we need not worry about the temporary expedients of our effective coordination of effort under the stress of this terrible effort, which compels a control the like of which has never been exerted before, but it is exerted, remember, gentlemen, by our authority, by the state which exists for us, and which differs therefore from the authority of the Germanic State in which man is for the state, while here the state is for man, and as we give control, so we can take it, and as we give our all in this hour, we give it not merely to make democracy safe, but to make *this* democracy safe.

JAMES A. EMERY
Photo by Harris and Ewing

In that spirit we can approach and maintain our part in this great struggle without fear of the future; we can look forward to a new world, a world in which the gross and material things have been burned out in the huge fire of war, in which men have learned in sacrifice new values for life and loyalty and obligation to individual and to government, in which men have sacrificed themselves to make a better world; and then we can look forward hopefully to that future; denying ourselves at this hour, we deny ourselves for a greater future, for, as surely as we save now, we shall have the means with which to repair and rebuild a ruined world, and to make our contribution, in commercial terms if you please, to the doing of that great task; but we shall also have the sublime opportunity of knowing that in a spirit of sacrifice we contributed our part.

We can look forward to that in the spirit of Roland in the Pass of Roncavallo, in the spirit of Sir Galahad and the Knights of the Round Table toward the Holy Grail, or as a dying Crusader gazed across the desert toward the minarets of Jerusalem, conscious that his struggle had made the Holy City nearer to a Christian hope; and we can look forward by the sacrifice of our effort to a disenthralled and regenerated world, in which not only little states shall have the right to work out their own existence, but in which we shall have preserved anew within the boundaries of our own great nation the right of every individual to work out his own success in terms of his own ability and character.

Bishop Du Moulin's Address

President Work next introduced the Right Reverend Frank Du Moulin, Bishop Coadjutor of Ohio, who spoke at last year's banquet. Bishop Du Moulin said in part:

I regret deeply the absence of the appointed chairman of this evening, because it has rather become my custom to introduce what I have to say by the telling of stories aimed at the target of the chairmanship; but in order to aim stories at a chairman, if the stories are told by a minister, it is rather necessary that the chairman should have some semblance of religious interest. I have been trying for a long time to find out if there could be any modicum of religious relationship on the part of the chairman of tonight, but the density of my intellectual processes has prevented me absolutely finding any. In fact, I feel that perhaps the chairman might echo the sentiment of David Harum, when he was asked which church he belonged to, and he said, "Well, the church I stay away from is the Episcopal Church."

But you need no introduction of humor into the atmosphere and sentiment of this great occasion this evening. We have listened to a remarkable interpretation of the great task of the age, the co-ordination and co-relation of mechanism and manhood. Both those qualities and elements are to be and are in process of being enlisted and invested to the full on the part of this young giant nation across the seas, that thereby it may become the determining and vital factor by which despotism shall be swept off the earth and liberty and democracy guaranteed to the generations of men.

MORAL COOPERATION

But if that task is to be achieved, if not merely the world is to be made safe for democracy, but democracy is to be made safe for the world, then I emphasize the fact that the moral quality in life is an imperative consideration. The words of the last speaker have brought that illuminatingly before us. In order to effect the most efficient, the maximum, the 100 per cent cooperation in the investment of mechanism and manhood, the moral quality in the individual is absolutely imperative, and that is symbolized for us today, I think, in quite a remarkable form.

We have looked out upon the capital cities of the world, we have seen the great military capitals like Rome and Constantinople, around which the forces of conflict have gathered and contested; we have seen the great commercial

THE EIGHTEENTH ANNIVERSA
ASSOCIATION

Photo by Drucker & Co.

HELD ON MONDAY EVENING, JANUARY 7, AT

SARY BANQUET OF THE RUBBER
ON OF AMERICA

, AT THE WALDORF-ASTORIA HOTEL, NEW YORK

THE RIGHT REVEREND FRANK DU MOULIN
(C) *Press Illustrating Service*

capitals of ancient times, like Thebes and Tyre; we have seen the great intellectual capitals like Athens and Alexandria; but Providence has placed paramount, within the past few days, above all other types and phases of metropolis and capital city, the great home which represents moral empire, the moral capital of the world's hearts and aspirations, and we have seen America, represented by its military representatives as they have accompanied General Allenby in taking possession of Jerusalem and overthrowing the unspeakable rule of the Crescent, that it might be replaced by the insignia of a Christian Empire.

Such an outstanding and paramount event seems to be the mandate from Providence to us that there shall be a renewed and essential, an integral, if you will, emphasis upon the moral element and quality of life, if we are to effect a maximum, a hundred per cent efficiency in the cooperative process of the coordination of mechanism and manhood in its investment in the interests of winning the war.

I rejoice that since we met last we as a nation have changed ourselves from being neutrals to becoming human beings. We will forget the fact that we waited so long to do so; but we rejoice to-night, gentlemen, in the fact that we have finally found ourselves in the greatest fight between right and wrong that the world has ever known, and that properly we have found ourselves on the right side.

It is not my purpose tonight to put before you the recreancy of Germany. We all know it too well. The evidences of it are too striking and too convincing to need any further emphasis upon it or interpretation of it. But I do want to place over against and in contrast to the recreancy of Germany, the idealism of America, and her contribution, her impact, her vocation, her drive, her place in the working out of the Divine plan for the progress and happiness of all humanity.

A NATIONAL CONTRIBUTION

I think, gentlemen, every nation that has ever lived on this earth as a nation has had some particularized national contribution to make toward human progress, human welfare, and human happiness. No nation, no barbarous tribe, however heterogeneous, however isolated or remote, has been removed from the mandate laid upon it, that as a nation it should discharge some contribution, it should place upon the altar of the world's well-being some quota of its own particular nationalized gift to the working out, the betterment of life and the achievement of progress, happiness and perfection for the sons of men.

Now, if that be the case, if ever there was a nation that was thrown into existence in the crucible of modern life, that had a distinctly marked and defined and characteristically executed and interpreted vocation, it is the vocation of these United States of America to human life today. Because, realize, men, that we are living in the most formative and flexible age in which human beings have ever drawn the breath of life; we are living in an age that is distinctly constructive.

A NEW AGE; A NEW WORLD

The last speaker has spoken of the new world. Yes, we are living in a new age and a new world. Oh, it is as if Providence had flung about us a new heaven and opened before us a new earth. I plead for the new man that shall be competent and qualified to live the life of the new heaven and the new earth into which Providence has ushered us, upon whose threshold today we stand.

I believe the age to be forward-bound. Its hope is anchored in the future, its golden day is yet to come, it is progressive, it is in the vanguard of the ages as it leads onward and upward in that mighty movement toward that "one far-off divine event to which the whole creation moves." I believe, gentlemen, that this is the greatest time in all the history of the ages in which a man could be allowed to live, because manhood is more potent and vital in its influence upon life today than at any other time in history, the long history of manhood upon the earth.

THE GREAT POWER OF TODAY

One man has greater power and opportunity in forming the flexible destinies of the world in which he lives than a hundred men in any age in the past—or, so far as we can see, one hundred men in any age that is yet unborn and that is yet to come. Furthermore, one dollar today will do more, I believe, in shaping and determining the destinies of the world and the ages, than the same amount in any age in the past multiplied one hundred fold, or than the same amount in the ages that are to come a thousand fold. It is as though we lived in the very nick of time—in the plastic formative constructive of the world's history.

Napoleon once said to his soldiers before the greatest one of his great battles, "Men, tomorrow as you enter upon that battlefield, upon you will look down forty generations of an ancestry that is gone, waiting for you to fulfill their determination." But I say that as we fight this fight today and invest ourselves to the full and the maximum in it, we can say to ourselves that forty generations of the future, unborn as yet, are looking to us to shape and determine the destinies that are to control their lives until the world becomes the seat of a self-respecting, liberty-loving humanity, and the forces, the reeking forces of lawlessness, are driven rough-shod off the face of the earth.

It is a glorious age in which to live. It is the noblest, the grandest age that has ever rolled out of the darkness into life and history of man, and we take upon our lips and into our thoughts the sentiment of the poet when he said, "We, you and I, we are living, we are dwelling, in a grand and awful time; in an age on ages telling, to be living is sublime."

AMERICA'S CONTRIBUTION

What is the contribution of America in this mightiest epoch of human affairs? This greatest age in which human beings have ever been allowed to live.

The contribution of the nation is determined by the qualities and elements that have been given that nation with which to work out and hew out, to shape and determine its contribution and its destiny. Just as with individuals. Every individual is given certain qualities and gifts as the tools through heredity and environment and qualities of character by which he is to shape and determine not merely the manhood and personality that is his, but the particular gift of that manhood and that personality is to contribute to the world's progress and well-being.

That is why we are all shaped differently. That is why no human beings are alike. Each one of us has our particularized, individualized, personalized contribution to make, and the terms, physically, mentally, psychologically, morally, spiritually, the diverse gifts that are ours in germ, in embryo, in essence, are the agencies, the tools, the channels, by which we work up to and discharge the particular contribution that we are to make to human life. That is why we all look differently. That is why we think with different words, feel with different hearts and act with different hands. There are certain gratifying features in this theory, if we follow it out.

I want to carry that thought, gentlemen, into the national consciousness. I want you to realize that as with an individual human being, as a separated personal entity, so with the nations of men. Each nation has its own gifts, its own qualities, and they are placed in its hands to shape, to perfect, to form, to project, to contribute that one thing upon which the whole future waits from that particular nation, and which it is untrue to itself and its destiny if it declines or rejects.

A PRODUCTIVE COUNTRY

Now, first of all, Providence has given this nation the most fruitful and productive continent upon which to house its life, that any nation has yet enjoyed. No nation which has ever lived has had the same resources placed under its care and under its developmental power and under the power of its scientific skill and ingenuity. No nation has ever been given the physical resources that the United States today enjoys; a continent having deep within it every type of quality and element that civilized man can use, everything that is used in the element of progress on the earth, is lying either in active process or dormant, latent, and waiting to be used in this mighty, productive, fruitful continent upon which our lives have been placed. That is the first quality with which Providence has endowed us, in order that He may help us to determine our destination among the family of the nations of mankind.

The second is not merely a marvelously versatile and varied and richly representative continent, productive of everything that is used in life, but equally as versatile and representative a climate.

Climate has a vital effect on personality. It reflects, its redound on human character and manhood is most pronounced. Take the nations that are given simply a single climate and you find a single-typed and monotonous nation. Take Russia with its climate, single-typed, and then look at the pathos and the tragedy of its millions of single-typed people, the plaything of any demigod who usurps the reign of power and who will take from them their self-respect and their moral ideals, simply because of the dull, low-leveled monotony of their innumerable population.

Now, America has been given, as the second quality, the second element with which to hew out destiny, the most versatile, the most richly

productive climate, including all types and all zones, under which any nation atmospherically has ever lived. Then, in addition to that, not merely continent under foot and climate-hung overhead, but on this soil has been set down every type of man that life knows, or, I suppose, ever will know—every kind of human being.

No part, no hamlet or community upon the face of the earth has been left out from contribution from the great melting-pot of America. It has become the Mecca, a meeting place of all the nations. Every nation, however isolated or remote, has made its contribution of human life; and in the great crucible of a hundred million human beings we are working out the most representative and versatile type of manhood that has yet been arrived at or attained in the history of man upon the earth.

Not merely that—that might seem enough—but on top of all that, Providence completed the thing as a great four-square, phalanxed, and meeting every wind from the heaven, when He gave us the fourth element, and the completing one, in the constitution of our mighty contribution to the betterment of the world, for then He opened the windows of heaven and showered down overlowingly into the lap of the nation the most prodigious, the most unheard-of, the most unprecedented and prodigal prosperity that any nation has ever possessed or enjoyed.

These four qualities of national vocation settle for us for all time our place in the life of civilization, and our particular contribution to the working out of the destinies of the human race, to the perfection and achievement of the Divine plan for the happiness and welfare of all humanity.

THE NEW TYPE

Now, if that be the case, what is the vocation? The vocation is not hard to find. It is easily analyzed, it is obviously seen and understood. The vocation was to lift the human race, the human family, up to a higher level of life and character and living, to perfect a new type of man and a better than life had ever known before, and a new and holier type of woman, a new and nobler type of childhood, and then through it all to set the strata and atmosphere of new relationships between man and man that should bespeak and achieve the highest and noblest form of fraternity in the mightiest democracy that the ages had ever seen.

Yes, we were to develop a new kind of man, a man who was to be just as shrewd and skilled a business man as the best type of business man in America today. He was to be just as ingenious, just as circumspect, just as rare in his control over the resources of the earth, just as successful in stamping the impress of man upon matter, and of personality upon the great crude forces that his genius conquered and organized for the betterment of life.

He was to be all that, just as much as today. But he was not to be solely that. He was to be developed and rounded out, enriched and completed, so that he would stand as the most representative type, complete in all its parts, the sweeter, nobler, more gracious qualities of his personality were to be developed and given a higher and loftier expression. He was to have a better appreciation of art, of architecture, of music, of sculpture, of literature, than any of the races that had preceded him. He was to have a fine, ethical emphasis upon life. His humanitarian side was to unfold itself, feel itself, fulfill itself, find itself. His fraternal sense was to be aroused and enlisted. His social vision was to be unfolded, his social imagination was to be quickened. His social interest was to be given the highest expression that such had ever attained upon the earth. Not merely that. His moral ideas were to be higher, his sense of right and wrong was to be keener and more acute, his whole moral emphasis was to be an enrichment and an improvement upon any that man in commerce had ever attained before. And, above and beyond that, he was to feel himself related not merely to this world in which he lives, but to all worlds everywhere in which he should ever have to live.

In other words, he was to "dip into the future far as human eye could see, see the splendor of the world and all the glory that should be." He was to be related to the unseen, eternal forces that are after all the most powerful, vital and paramount with which human nature has to do. That was to be the type of manhood that was to be developed in order that we might bring to the birth and on to perfection the new man that should be worthy to live in the new age, under the new heaven, with his feet on the new earth on which God had placed him. There was to be a new type of womanhood, too.

There was to be a new type of child on the earth. That has been brought home to us and driven into our consciousness today, in the camps and cantonments that are organized all over this fair land, because there the axioms of their usefulness are found in three things: first of all, a respectful authority; secondly, habits and developments of personal discipline; and, thirdly, the fine quality of obedience, highly vitalized and organized; and every soldier and sailor in any camp or ship flying the flag of the United States knows well today that if we are to be an element in winning the war, then there has got to be organized as axioms of all our preparation, in camp and cantonment everywhere, respect for authority, personal moral discipline, and the quality of obedience.

Now, we need ..ake that which is axiomatic in our camps, a.. to drive it into the homes of our nation, so that our children, the new childhood of the age, shall be dominated not by what it wants to do, but by what it ought to do, shall be governed and controlled not by inclination but by obligation, and thus learn that if the world is to feel the thrill and the impact of this mighty coordinated nation, with all its multiplied types of personality and all its ingenious and officially organized elements of manufacture and mechanism, that then it can be only in so far as the personal will is invested for the good of the whole, and every child in every home appreciates the new demand that is made upon it in the interests and direction of self-investment.

THE VOCATION OF AMERICA

So, gentlemen, I put before you the vocation of America. Now let me ask you, before I conclude, are we arriving at that condition? Have we reached it? What have we been doing in the past twenty-five years of time, with these resources that constitute the developmental qualities by which we perfect and discharge our vocations and make our contribution to world progress and world happiness? I think you will realize with me that our tendencies have been in the opposite direction.

Now, gentlemen, it is not what a man is that counts. He may be the best man in the world, or he may be the worst. I don't care. It is what a man is becoming that counts and tells. So it is with a nation. A nation may be the best or the worst. That matters not. It is what a nation is in process of becoming that counts in its influence and power upon the earth.

It was not what America was that gave us very much concern in the past few years. We were all proud of her; we loved her. Whether the land of our adoption or the land of our birth, our love and loyalty went out to her in fullest measure. We loved her and were proud of her to the full. But it was what America was in danger of becoming that caused most of us very serious and real concern. We were in a condition of morally unstable equilibrium. The fine sense of the right and wrong of the nation was being dulled and stunted and blunted. We were enervating our moral structure. We were depreciating our spiritual vision. We were watering the stock morally and lowering the type, though we were not conscious of it.

It began to express itself in the place where it always first manifests itself, in the home life, at the hearthside of the domestic life of America, with its infelicities and infidelities, and was beginning to tell the story of conditions that were exactly similar to the conditions that preceded the decline and fall of ancient Rome, and just as we have heard down the corridors of the centuries the crash of the empires thundering to the dust, for this very reason, for this self-same reason, if it had not been for the renaissance, the moral renaissance of today, that has come today upon America, the awakening of our conscience, the arising of our moral ideals and their restoration, then I say, men, we would have been in danger, the same danger as those mighty nations that thought themselves so invulnerable that they styled themselves eternal.

And we dig deep beneath the dust of the centuries today to find some remaining evidence of their vaunted strength and splendor, and we find them buried in the sepulchres of their own past, interred in the sarcophagi of their own self-indulgence.

WE ARE AROUSED

But since we met last we have awaked; we have been aroused. We decline to work out our contribution in an atmosphere of peace, and doing that, there was but one alternative left, and that was to be compelled to work it out in the sufferings, privations and horrors of war.

Members and Guests at the Banquet

The following is a list of the members and their guests who were present at the banquet:

A

Achelis, F. G.
Adams, C. J.
Adams, H. J.
Adams, J. J.
Alland, Leon
Andersen, E. A.
Anderson, F. C.
Anderson, J. D.
Andrews, W. S.
Appleton, F. H.
Appleton, Judge Chas.
Appleton, Lloyd E.
Armitage, J. D.
Armstrong, H. G.
Arnold, W. H.
Ashcroft, R. W.
Ashley, Thomas A.
Astor, A. Melville

B

Babcock, F. H.
Babcox, E. S.
Bacon, H. M.
Badenhop, Robert
Bailey, I. R.
Baird, Collier W.
Baird, H. W.
Baird, Robt. B.
Baird, Robt. L.
Ballou, W. S.
Baird, Wm. F.
Baker, G. R.
Baker, H. D.
Baker, K. C.
Balch, W. H.
Baldwin, James C.
Baldwin, S. D.
Ballou, Roland H.
Barker, C. E.
Barnard, H. H.
Barnwell, E. H.
Barnes, C. W.
Barton, B. W.
Bass, W. H.
Bassett, F. W.
Basten, Otto
Bates, E. A.
Baum, J. E.
Bayley, C. Clive
Beal, Herman L.
Bedell, Harold H.
Bedford, Bruce
Belcher, E. W.
Belcher, Fred S.
Bers, Aaron
Bers, Edward
BeSaw, Chas. A.
BeSaw, E. W.
Birkenstein, Louis
Birkenstein, Milton
Bishop, E. A.
Bixler, H. W.
Blackwell, W. H.
Blake, H. F.
Blanchard, H. J.
Blandin, V. C.
Blatt, H. O.
Bliss, W. R.
Boggs, Charles R.
Bourn, Hon. Aug. O.
Bourn, Aug. O., Jr.
Bourn, Col. S. W.
Bradley, C. E.
Braender, F. L.
Braender, H.
Braender, W. P.
Brenner, James
Brinckerhoff, E. A.
Broadwell, E. H.
Brodhead, Garrett, Jr.
Bronard, E. W.
Brooks, E. H.
Broughton, J. S.
Brown, A. H.
Brown, Andrew H.
Brown, Mr.
Brumley, H. V.
Brush, George
Bruyn, Wm. E.
Bryant, Earle L.
Bryant, George G.
Buecher, E.
Bunker, Horace
Burdick, A. H.
Burgess, Charles S.
Burr, A. E.
Burton, Theodore E.
Butler, Obadiah
Byles, W. E.

C

Caldwell, E. M.
Caldwell, J. D.
Callahan, J. T.
Camp, H. C.
Campbell, Philip H.
Campbell, Samuel S.
Candee, C. N.
Candee, W. C.
Capen, Louis
Carkhuff, S. G.
Carleton, W. S.
Carnahan, G. H.
Carr, Ashton L.
Carroll, J. M. S.
Cartmell, Robt.
Cartmell, Van H.
Cary, J. D.
Case, C. C.
Cast, J. F.
Chadbourne, Joseph H.
Chalfin, Joseph
Chandler, John J.
Chipman, R. L.
Christie, J. A.
Clark, C. B.
Clark, C. S.
Clark, Myron H.
Clemens, James
Clement, P.
Clements, Dr.
Clifford, James J.
Clift, Robt. E.
Cobb, H. Z.
Cook, C. E.
Cook, H. L.
Cook, M. M.
Cook, O. R.
Cooke, G. A.
Cooke, Vincent
Corbin, C. E.
Cornell, A. Boyd
Cottle, Geo. T.
Coughlin, E. J.
Coughlin, T. B.
Cowen, Rawson R.
Crane, R. B.
Cranz, W. B.
Craver, B. B.
Cremer, H. R.
Crowley, John T.
Cummings, E. O.
Cummings, H. H.
Cummings, W. L.
Curtis, F. L.
Cutler, D. A.
Cutter, Wm. O.

D

Daggett, H. A.
Dammen, M.
Dane, Francis S.
Dann, C. A.
Dannenbaum, H. M.
Dannerth, Frederic
Davis, Edgar B.
Davis, G. G.
Davol, Chas. J.
De Lanie, Herbert S.
De Long, Wm. A.
Desmond, Thomas A.
Devine, Jas. W.
Dickerson, George B.
Dickinson, F. S.
Didier, Henry
Dodd, Samuel H.
Donaldson, R. M.
Donovan, M. J.
Drake, F. A.
Drake, R. E.
Drayton, Judson
Drew, W.
Drisler, W. A.
Duclos, Louis O.
Duffy, Louis A.
Dumont, L. W.
Dunbar, F. W.
Dunbar, J. Frank, Sr.
Dunbar, J. Frank, Jr.
Dunn, H. T.
Dunn, W. H.
Dunsford, S.
Durr, H. H.
Duryee, A. R.
Du Moulin, Rt. Rev. F.
Dwyer, Thomas A.

E

Eagles, R. P. M.
Earle, R. W.
Ecker, F. H.
Emory, James A.
Elbogen, Paul
Eskenazi, R.
Evans, S. M.

F

Fairbank, L. G.
Fall, Sidney
Fargo, A. W.
Farson, John
Favor, Irving P.
Fay, E. E.
Feinburg, D.
Ferguson, Irving B.
Field, H. E.
Fielding, H.
Fields, R. K.
Figart, D. M.
Finck, Carl
Finley, Joseph
Firestone, H. S.
Firestone, Harvey S., Jr.
Firestone, R. J.
Fisk, H. G.
Fisk, Haley
Flint, Dr. H. A.
Foote, R. F.
Fox, Frank F.
Francis, A. W.
Fraser, Edgar B.
French, H. W.
Freshman, Chas.
Fries, R. J.
Frissell, F. H.
Fulkert, Charles
Fuller, Harold P.
Fulper, Edward B.
Fultz, David S.
Furth, O. H.

G

Gardner, T. M.
Garretson, C. D.
Garthwaite, A. A.
Gaston, Clarence E.
Gaston, William F.
Gates, H.
Gaver, F. W.
Gay, E. A.
Geer, Dr. W. C.
Giles, James F.
Gill, O. W.
Githens, H. A.
Glaenzer, G. B.
Glass, R. E.
Glidden, A. A.
Goff, F. H.
Goldman, Herman
Goodwin, Leonard
Gordon, W. S.
Gough, Wallace L.
Gove, F. G.
Grafton, Edwin H.
Graves, B. O.
Gray, Daniel
Green, H. M.
Greene, N. Lincoln
Greene, W. E.
Greenough, Allan B.
Gribbon, J. J.
Griffin, Robert G.
Gunn, J. N.

H

Haarrtz, J. C.
Haldane, D. Douglas
Hall, Geo. E.
Hall, J. P.
Hamilton, R. S.
Hammersfahr, W.
Hardenbergh, Ambrose
Hardin, C. W.
Hardy, Roger S.
Hardy, W. E.
Harlow, Robt. C.
Harris, Hayden B.
Harrison, O. M.
Hartford, Dr. P. C.
Hauff, H.
Heischmann, E. L.
Henderson, Bancroft W.
Henderson, Eliot M.
Henderson, F. B.
Henderson, Francis R.
Henderson, Harold H.
Henke, Gustave R.
Henne, Geo. W.
Hering, Henry F.
Herron, John
Hewins, E. D.
Hewitt, H. H.
Hichborn, G. F.
Hill, F. G.
Himebaugh, L. C.
Hirsch, I. Henry
Hodgman, G. B.
Hodgman, S. T.
Holcombe, H. W.
Hood, Frederic C.
Hopkins, Mr.
Hopkins, M. G.
Hopkinson, Ernest
Hopper, C. C.
Horn, Frederick J.
Houk, H. L.
Howard, Daniel S.
Howell, B. J.
Hoyle, Brig. Gen. E. D.
Hubbard, H. B.
Huber, Edward E.
Hydes, Thomas

J

James, H. B.
Jamieson, R. E.
Jamison, C. S.
Jeandheur, George E.
Jenckes, F. L.
Jenkins, H. W.
Jewett, H. M.
Johnstone, J. T.
Johnstone, W. A.
Jones, E. P.
Jones, Frederick H.
Jones, S. H.

K

Kains, Archibald
Kanki, Eizo
Kaufman, M. B.
Kaufmann, C. B.
Kavenagh, Wm. E.
Kearns, John
Keeler, Louis V.
Kelly, J. H.
Kelly, Timothy J.
Kelly, Dr. W. J.
Kelly, Wm. J.
Kendall, J. A.
Kennedy, D. G.
Kerr, J. H. S.
Kies, W. S.
Kimball, T. F.
Kingston, G. E.
Kittle, F. Lester
Klauber, E. C.
Klass, Geo. C.
Kreuder, Wm. J.
Krogh, J. P.
Kuble, D. S.
Kugler, H. W.
Kurvy, J. A.

L

LaDow, Jesse E.
Lahey, F. T.
Lambert, J. A.
Lamont, Sloan, Jr.
LaMotte, F.
Lamson, F. L.
Landers, Mr.
Laurie, T., Jr.
Laurie, W. D.
Lazarus, H. E.
Learned, Jas. H.
Le Pan, Louis N.
Lewis, Seneca G.
Lewis, Tracy S.
L'Hommedieu, Paige B.
Liddell, Wm., Jr.
Linerd, J. B.
Lingley, F. W.
Litchfield, P. W.
Little, Clinton E.
Littlejohn, Lomax
Littlejohn, Lomax, Jr.
Littlejohn, R. M.
Lloyd, Francis E.
Loeb, Milton
Loewenthal, Max
Loewenthal, R. M.
Lohmann, A. P.
Long, J. W.
Louis, Irving J.
Louis, Joseph J.
Low, C. H.
Low, R. A.
Lowe, George, Jr.
Lowman, J. S.
Ludington, G. A.
Ludwig, L. J.
Lund, Carl O.
Lynah, James

M

McCallum, Fred
McClaren, H. L.
McConoughby, D.
McDonald, A.
McDonough, Alfred G.
McKay, C. B.
McKay, E. B.
McKenna, Francis R.
McKenny, L. J.
McLean, Jos. F.
McMaster, H. R.
McMichael, J. C.
McMichael, L. P.
MacKusick, H. A.
MacMillan, John A.
MacPherson, Warren
Mackay, Wm.
Macomb, John W.
Maguire, John W.
Maguire, T. A.
Mahoney, P. H.
Mahony, Walter B.
Maltus, W.
Manchester, A. A.
Marcus, A.
Marean, Browning E.
Marland, Wm. H.
Marsh, H. L.
Marshall, T. C.
Martin, Bertram T.
Mason, D. M.
Mason, O. M.
Maurer, Ed.
Maurer, E. J.
Maus, J. B.
Mayo, G. H.
Meacham, John J.
Meade, James
Measure, Chas.
Merrell, J. H.
Merriman, I. B.
Meyer, Adolph
Meyer, Chas. A.
Meyer, Otto
Meyers, A. C.
Miho, Kantaro
Miller, H. C.
Miles, Col. D. E.
Miley, C. E.
Miller, Amos C.
Miller, Chas. E.
Miller, J. A.
Miller, Wm. B.
Milne, Gordon
Milner, W. M.
Miner, W. H.
Mitchell, J. K.
Montgomery, Henry
Moon, A. E.
Morehead, H. J.
Morgan, John
Morse, W. M.
Moses, Fred L.
Movack, F. E.
Mowe, J. V.
Muehlstein, H.
Muehlstein, J.
Mullett, W. C.
Murphy, Fred K.
Murray, C. Edw., Jr.
Murray, J. Cornell
Myers, L. J.

N

Nagano, Tamotsu
Naylor, R. B.
Nevin, A. Parker
Newcombe, Richard N.
Nichols, Mr.
Nickel, F. B.
Norwood, Guy E.

O

Oakley, C. H.
Oakley, L. M.
Obalski, T. W.
Oberlander, M. A.
O'Brien, James
Odell, James E.
Odell, L. G.
Oliver, H. E.
Osterlob, A. F.
Owens, R. J.

P

Page, John E.
Palmer, Mr.
Parsons, W. Guy
Partridge, A. G.
Partridge, F. E.
Patrick, R. W.
Pearce, H. E.
Pearce, Robert M.
Peaty, F. H.
Peech, Lawrence
Pell, G. E.
Perlish, Henry
Perrett, Wm.
Peterson, Frederick B.
Peugnet, J. J.
Pfaff, E. F.
Pfeiffer, Wm. F.
Pharis, Carl
Pitcher, Conrad N.
Pitcher, W. L.
Place, C. A.
Place, Charles H.
Place, F. N.
Plumb, L. J.
Poel, Frank
Post, F.
Pratt, Archer S.
Pratt, B. H.
Pratt, L. R.
Presbrey, Frank
Price, T. B.
Procter, Wm. L.
Procter, Lawrence B.
Pusinelli, Fred

R

Raymond, H. E.
Reagan, D. G.
Reddy, H. H.
Reeve, Arthur
Rice, Robert L.
Richards, Leonard, Jr.
Richards, T. G.
Richmond, C. A.
Ridge, W. F.
Rieder, T. H.
Riley, H. B.
Roberts, M.
Robertson, J. G.
Robinson, Francis H.
Roche, Frank
Rockwell, George H.
Rodman, H. B.
Rogers, Walter F.
Roig, Harold J.
Ropes, Ripley
Ross, F. G.
Rothschild, M.
Rousmaniere, J. E.
Ruddell, A. G.
Russell, J. H.
Rutherford, W. O.
Ryckman, W. G.

S

Sanders, W. W.
Sattler, E. A.
Saunders, R. E.
Sawyer, A. M.
Schaeffer, S. A.
Schaffer, F. F.
Scheel, H. Van Riper
Schulthess, Ernest
Schwab, F. M.
Scott, W. C.
Seaman, F. A.
Sears, S. H.
Selberling, F. A.
Seko, Kohnosuke
Semple, C. H.
Severance, H. C.
Seward, Wm.
Sharts, F. W.
Silliman, E. B.
Simonson, W. A.
Simpson, W. B.
Sisler, L. E.
Skinner, John
Skirm, Geo. W.
Slider, C. W.
Slusser, C.
Smart, W. A.
Smith, A. W.
Smith, Frank E.
Smith, H. O.
Smith, Herman E.
Smith, H. W.
Smith, J. Sheppard
Smith, L. F.
Smith, Theodore E.
Smith, Willard P.
Smith, Wm. B., 2d
Snodgrass, R. P.
Sorrick, C. E.
Spadone, Amedee
Spadone, Henry
Spencer-Hess, A. C.
Spraker, L. D.
Springer, F. V.
Stabler, Walter
Stadelman, G. M.
Stedman, James H.
Stephens, Geo. P.
Stephens, Wm.
Stern, Fred
Stiles, Lynn D.
Stiles, Wm. H.
Stimpson, H. W.
Stokes, Charles E.
Stone, J. Everett
Stretch, C. B.
Studebaker, C. D.
Swaeny, C. R.
Sweeney, E. C., Jr.
Swinehart, B. C.
Sydemon, J.
Sydemon, W.

T

Tajima, Shigeji
Talbott, F. R.
Tallman, A. V. W.
Taylor, M. N.
Tennant, H. Q.
Tenney, John, Jr.
Teshima, Tomotake
Thalhimer, A. S.
Thomas, J. W.
Thomas, L. H.
Thomas, W. G., Jr.
Thompkins, Mr.
Thornton, A. D.
Thorstensen, C. E.
Thropp, Peter
Tobin, Horace B.
Tompkins, L. D.
Townsend, A. F.
Townsend, G.
Tucker, A. G.
Tullar, Byron E.
Turner, M. A.
Tweedy, O. S.
Tyson, Robert E.

V

Van Alst, J. Milton
Van Cleaf, John C.
Van Etten, J. de C.
Van Kleeck, C. M.
Van Sielen, Arthur
Vance, L. T.
Vander Plas, Gov.
Vanderbilt, R. T.
Vanderlip, Frank A.
Viall, H. T., Jr.
Voorhees, John J.
Vorhis, H. S.

W

Walsh, Thomas H.
Walton, W. R.
Wanning, F. D.
Wanning, H. F.
Warner, Lewis C.
Warren, A. W.
Weber, L. E.
Weeks, P. S.
Welda, H.
Weitling, W. W.
Welton, Spencer
Wesley, P. R.
Weston, J. C.
Westren, J.
Whipple, M. P.
Whitehead, Alfred
Whitehead, H. H.
Whitehead, R. R.
Whitehead Robert V.
Whitenack, W. A.
Whiting, Mr.
Whitman, R.
Whittaker, Wm.
Whyte, A. E.
Whyte, J.
Wies, George A.
Wilcoxson, J. F.
Williams, A. W.
Williams, E. S.
Williams, H. M.
Williamson, H. L.
Wilson, C. D.
Wilson, Chas. T.
Wilson, E. H.
Wilson, W. E.
Wolff, K. I.
Wood, Charles E.
Wood, J. W.
Wood, Le Roy
Wood, Theo.
Wodard, S. P.
Woodbury, R. B.
Woodhouse, D. A.
Woodward, Fred R.
Woodward, H. J.
Woodward, Van Lear
Work, B. G.
Worthington, H. D.

Y

Yamanaka, Seizaburo
Young, C. T.
Young, Philip E.
Yule, W. H.

Z

Zerfing, Dr. H. F.

Telegrams of Regret

The following telegrams of regret were received from prominent persons unable to attend the annual banquet:

"WASHINGTON, D. C., Jan. 3, 1918.

H. S. VORHIS,
Secretary Rubber Association, 17 Battery Place, New York.

I regret very much that pressure of duties makes it impossible for me to accept your very kind invitation for the annual banquet on January seventh. Please to convey to the Club my deep appreciation of the courtesy and consideration they have always shown in their relations with this Embassy and my best wishes for the continued prosperity and success of their organization.

RICHARD CRAWFORD,
(Of the British Embassy).

"WASHINGTON, D. C., Jan. 4, 1918.

H. S. VORHIS,
Secretary Rubber Assn., 17 Battery Place, New York.

Have just received your telegram of January second. Greatly regret inability to accept kind invitation as I cannot leave Washington just now. Please convey to the Association my congratulations on their excellent work in the common cause and my cordial good wishes for their continued success and prosperity.

BRODERICK."
(Of the British Embassy).

"ALBANY, N. Y., Dec. 27, 1917.

W. T. COLE,
Chairman of the Banquet Committee, Rubber Ass'n. of America, 17 Battery Place, New York, N. Y.

I sincerely regret that an official engagement for the evening of January seventh makes it impossible for me to accept the very kind invitation of the Rubber Association of America to attend its eighteenth annual banquet to be held at the Waldorf-Astoria on that evening. Please assure the members of your committee of my appreciation of this invitation.

CHARLES S. WHITMAN."

"BUFFALO, N. Y., Jan. 3, 1918.

W. T. COLE, *Chairman*,
17 Battery Place, New York, N. Y.

Please accept thanks for your cordial invitation to banquet, Monday evening, of Rubber Association. Sincerely regret inability to be present. Thank you for invitation which I thoroughly appreciate.

CHARLES CLIFTON."

Outlook Favorable for 1918 Says Col. Colt

U. S. Rubber Co. Business Showed Marked Increase Last Year Over 1916—Government Orders of Increasing Importance—Rubber Footwear Prices Advanced Due to Greater Cost

In a recent statement, Col. Samuel P. Colt, president of the United States Rubber Co., points out the favorable outlook for the rubber trade for 1918, with the prospect of an increased production and a fair margin of profit. He said:

The column of business of the United States Rubber Co. for the year 1917 will be upward of $160,000,000, as against $125,000,000 in 1916. Barring unforeseen calamities growing out of the war, as interference with our crude rubber supply, which is now derived largely from the Far East, our sales for 1918 should increase still further.

Our direct orders from the Government are now larger than heretofore, but in percentage would not exceed 10 to 15 per cent of our total business, which percentage, however, will undoubtedly increase, as the war progresses, so many manufactured articles made from rubber, as tires, boots and shoes, and cloth for aeroplanes, being essential for the conduct of the war.

The prices of all materials entering into the manufacture of rubber goods, as well as the cost of labor, have advanced considerably during the past twelve months. For this reason the percentage of profits on goods tends to decline. To meet the higher costs we have already taken steps to make an upward revision in prices covering rubber boots and shoes as of Jan. 1, 1918. For the same reason mechanical goods have already been advanced. We may also be compelled to take up the question of a new schedule for tires. But only where it is absolutely necessary will we advance the present scale of prices, and then only to take care of rising costs of raw materials and higher wages.

Our trade is gradually expanding. There is a growing demand for mechanical goods, which has been given a remarkable stimulus coincident with the unexampled prosperity in various lines of manufacture. Another highly significant fact in this connection is the recent action of the Government in taking over control of the railroads.

Evidence is not wanting that the automobile will play an important part in solving the transportation problem. This is indicated in the fact that manufacturers are urging owners to cooperate in the movement to relieve the situation. The importance of this, as bearing upon the future consumption of tires, I consider very great. In analyzing our transportation facilities it is apparent that everything on wheels must be used and mobilized second to the railroads. As an adjunct and supplementary to them in collecting and distributing merchandise is the automobile, which promises to play an important part in relieving the congestion in passenger and express traffic. More than 60 per cent of the automobiles in the country are used in rural communities or on farms.

There will undoubtedly be a large curtailment in the use of pleasure cars as the war goes on, but notwithstanding this, the demand for tires, including the truck tire, promises to be greater in 1918 than in 1917, and I predict that the increase in volume will not be less than 20 per cent.

There is not now difficulty in securing adequate supplies of crude rubber, excepting for delays incident to transportation, ocean and rail, and the consequent necessity for carrying very much larger inventories of crude materials at the mills, and in transit, and at the Far East.

The increasing importance of cotton in the rubber industry is not generally realized, and while the trade uses but a small portion of the total cotton crop, the increase in its price has advanced materially the cost of all lines of rubber goods. The activity in production of cotton fabrics incident to the protection of Government requirements, necessitates the carrying of larger stocks wherever possible, and the investment of a much greater amount of working capital on account of the increased price.

The products of our company belong to the field of strict utility, and for all corporations manufacturing similar products there is not only the opportunity but the duty to press their trade both in domestic and foreign markets.

COL. SAMUEL P. COLT
Photo Skonberg

News Notes of the Rubber Trade

Great Demand for Rubber Boots—Dayton's New Selling System—Rubber Men in the Service—Modifies Enemy Trade Rule—Portage Is Busy—J. H. Mason Is Superintendent of Stamford Rubber Supply Co.

Great Demand for Rubber Boots

A great deal has been said and written concerning the magnitude of orders for Army shoes placed in the United States since our entrance into the war. These orders have been huge and run into very nearly $100,000,000 of gross business. But the producers of rubber footwear have had some very big orders not alone from the United States Government for its Army and Navy, but also from France, England and Belgium.

Since July the United States Government's buying department has been placing orders with rubber footwear producers not only for its own needs, but has been ordering directly for the account of France, England and Belgium. Italy has done its buying independently. Altogether it is safe to place the total orders for rubber boots which the United States has given out at 3,000,000 pairs. France has taken the largest amount with orders for about 1,000,000 pairs. These are the short rubber boots. The English and American orders call for a hip rubber boot, due to mud in Flanders and Northern France.

In addition to these orders the United States Government has placed for its own and allied account orders for between 800,000 and 1,000,000 pairs of "four-buckle gaiters," which are practically the equivalent of what the civilian population uses for "arctics." The big rubber footwear orders mean that the rubber factories will be rushed until February filling Government needs. Production of women's and children's footwear is not affected. The Government orders have the right of way only so far as men's footwear is concerned.

Modifies Enemy Trade Rule

Regulations prohibiting American business concerns from trading with the enemy were modified by the War Trade Board to permit branch houses in neutral countries to do business with the enemy, when a refusal to do so would constitute a violation of the law or of a commercial obligation enforceable in the country in which the branch is located. No house, however, taking advantage of the ruling will be permitted to enter new transactions with the enemy.

J. H. Mason with Stamford Co.

Jesse H. Mason, formerly chief chemist of the Plymouth Rubber Co., has accepted the position of superintendent of the Stamford (Conn.) Rubber Supply Co.

Dayton's New Selling Campaign

The 1918 selling plans of the Dayton Rubber Mfg. Co., Dayton, Ohio, include an extensive advertising campaign, covering all national, farm and trade periodicals. The plans also provide unusual advertising and selling co-operation for dealers. The pneumatic tire, known as the "Dayton Thoroughbred," is to be put on a quality basis, and dealers handling Dayton airless tires will be interested in the announcement of a large increase in the production of Ford sizes.

During the past year, the company has made rapid strides and is now working three shifts a day in the factory. The new plant, which more than doubles the output, was completed last month. The company has been gradually supplementing its sales force, and the opening of three new branches necessitates the employment of fifty or more additional salesmen for the coming season. It is proposed to open other branches in principal cities. On Oct. 1, the company paid its regular quarterly dividend of 7 per cent on its preferred stock.

Rubber Men in the Service

Following are additional enlistments from the ranks of the rubber industry:

United States Rubber Co.—W. W. Hill, Massachusetts Engineers.

Kelly-Springfield Tire Co.—Charles J. Holmes, truck tire salesman, Baltimore branch, Lieutenant-Commander, United States Navy; Thomas Delaney, advertising department, Co. D, 165th Infantry, U. S. A., Camp Mills, Mineola, N. Y.; R. W. Llewellyn, Columbus, Ohio, Depot, 2nd Ohio Field Hospital Co., 37th Div. U. S. A., Camp Sheridan, Montgomery, Ala.; John W. Maginnis, New York branch, Seaman, 1st Battalion, Naval Militia, N. Y. N. G.; John M. Kelly, Statistical Department, New York branch, Co. B, 71st Regiment, N. Y. N. G., now at Camp Wadsworth, Spartanburg, S. C.; William F. Daly, chauffeur New York branch, Co. C, 12th Regiment, N. Y. N. G., now at Camp Wadsworth, Spartanburg, S. C.

Portage Is Busy

W. W. Wildman, head of the Portage Rubber Co., Barberton, Ohio, is enthusiastic over the outlook for the rubber trade in 1918, and states that the company has lately increased its daily production to 2000 tires. Because the company has all the business it can handle, no new branches are planned at present.

Some Rubber Trade Activities

Ajax Buys Property—Over 400 Fisk Men Join the Colors—Batavia Elects New Officers—Keystone Gives Bonuses to Employes—Standard Four Expands—Bourn Secures Permit to Build

Ajax Buys Property

The Ajax Rubber Co., Trenton, N. J., and Racine, Wis., is reported to have purchased a building formerly used by the American Sugar Refining Co., with a frontage of 900 feet and a depth of 470 feet on the East River and Newton Creek, Brooklyn, N. Y. The value placed on the property is $2,000,000.

At present there are a number of old brick and frame buildings, but from present indications it is the intention of the new owner to improve the property.

The sale of the property to the Ajax Co. was negotiated by William A. White & Sons, 46 Cedar Street, New York City.

Christmas Gift to Rex-Hide Employes

The Rex-Hide Rubber Manufacturing Co., East Brady, Pa., gave to each of its employes as a Christmas gift an extra full day's pay. The company took this method of expressing its appreciation for the loyal support and cooperation of all its workmen, who have been putting forth every effort to complete the company's new rubber factory by the end of the year.

Bourn Obtains Permit to Build

The Bourn Rubber Co., Providence, R. I., recently obtained a permit for the erection of a one-story manufacturing building on Waldo Street. The structure is to be 102 by 100 ft. and will be built of brick.

A. W. Anthony Enlists

Andrew W. Anthony, manager of the topping room of the National India Rubber Co., Bristol, Conn., has resigned his position and left for Newport to become a boatswain's mate in the Naval Reserve Corps.

Over 400 Fisk Men Join Colors

Of the 411 members of the Fisk Rubber Co., Chicopee Falls, Mass., who are now in war service, fifty are officers. One is a major; one, possibly, more, has a captaincy; eight are lieutenants; 22 are sergeants; 15 are corporals and three are commissioned men in the medical corps. There are 32 out of the 411 enlisted in the navy. In the foreign army corps enlisted from the Fisk plant, three are with the Polish, five are with Canadian contingents, two with the British and one with the French.

PORTUGUESE TROOPS UNLOADING TIRES IN FRANCE
Photo Kadel & Herbert

Coal Gas as Automobile Fuel

The Consolidated Gas Co., New York City, has recently been conducting experiments with illuminating gas in running automobiles. Unlike the English practice the gas used is compressed in a steel tank, to 100 pounds to the inch, and it has been found that the car used requires 273 cubic feet of gas to equal a gallon of gasolene. It is not considered that the experiments presage the offering of illuminating gas cylinders on the market, as there is enough gasolene to go around, according to Fuel Administrator Garfield, and, therefore, the use of coal gas will not be necessary here.

J. H. Williams Receives Commission

J. Hayden Williams, formerly chief inspector at the Hartford Rubber Works, has been commissioned as lieutenant at Plattsburg, N. Y.

Lynn Rubber Co. Busy

The Lynn Rubber Goods Manufacturing Co., Lynn, Mass., is making 8,000 rubber heels daily, in addition to rubber soles and arch supports.

To Establish Auto Mail Service

According to an announcement by Postmaster Guffy, motor trucks are to displace railroad trains as mail carriers on two long routes out of Pittsburgh as soon as contracts can be let. One line, which is sixty miles long, will connect Pittsburgh and Wheeling, W. Va., and the other, 140 miles, will connect Pittsburgh and Cumberland, Md. Round trips will be made to Wheeling every day, but two days will be required to make the trip to Cumberland and return.

Batavia Elects New Officers

Thomas Lyman, credit manager, and Maxwell Bochow, assistant treasurer of the Metropolitan Trust Co., have been elected treasurer and general manager, respectively, of the Batavia Rubber Co., Batavia, N. Y. Mr. Lyman succeeds O. M. Darvin, and Mr. Bochow fills the vacancy caused by the retirement of George W. Hodges of Remich, Hodges & Co. The company will open executives offices in New York.

Standard Four Tire Expands

The Standard Four Tire Co., Keokuk, Iowa, has set aside the yearly interest of 8 per cent on preferred stock and declared a dividend of 20 per cent on common stock. The capitalization of the company has been increased from $200,000 to $4,150,000, of which $3,500,000 will be preferred stock and $650,000 common stock. A new plant will be erected immediately.

Request for Bids

Paymaster of the Navy, General McGowan, is asking bidders to submit proposals for miscellaneous quantities of rubber-covered duplex wire and plain and leaded and armored twin-conductor wire for immediate delivery to the New York Navy Yard.

Keystone Gives Bonuses to Employes

The Keystone Tire & Rubber Co., New York City, reports that its business for the year 1917 was nearly treble that of 1916, and consequently the company decided to grant bonuses to its employes. The members of the company's force received from five to twenty per cent of their salaries, according to the length of time they were with the company.

W. H. Mott Married

W. H. Mott, advertising manager of the Plymouth Rubber Co., Canton, Mass., has joined the ranks of the benedicts. After a sojourn through southern climes Mr. and Mrs. Mott will make their home in Foxboro.

Crane Made Manager

R. B. Crane has been appointed manager of the sundries division of the Racine Rubber Co., Racine, Wis. Mr. Crane is a veteran in the rubber business and his experience fully qualifies him for his new position.

Greenup Appointed Purchasing Agent

Walter Greenup was recently appointed temporary purchasing agent at the plant of the National India Rubber Co., Bristol, R. I.

Ideal Increased Capital

The Ideal Tire & Rubber Co., Cleveland, Ohio, has increased its capitalization from $1,000,000 to $2,000,000.

Items of Interest to the Rubber Trade

U. S. Rubber Co. Has War Orders—Woonsocket Contributes to K. of C. Fund—Gasoline Substitute—Goodyear Friars Bring Cheer to Soldiers—Broughton Directs Fuel Campaign—Litchfield Appointed on War Committee

U. S. Rubber Co.'s War Orders

The United States Rubber Co., New York, reports war orders totaling nearly $5,000,000. A portion of this business is for the French Government. During the current year the company's tire business will amount to $55,000,000, about 35 per cent of its entire business. On the basis of earnings for the eleven months ended Nov. 30, the company will show a minimum net for the full year of $15,000,000 after an allowance of $1,000,000 for special war taxes. Preferred dividends for the year will take $4,800,000, which will leave at least $10,200,000 for the $36,000,000 common stock, or approximately $20 a share. These earnings are the largest in the history of the company and compare with $15.12 a share earned on the same amount of stock a year ago.

Woonsocket Contributes to K. of C. Fund

A check for $1000 from the Woonsocket Rubber Co. has been received for the Knights of Columbus War Camp Fund. Information about it was received in a communication from Col. Samuel P. Colt, together with his personal check for $100. Col. Colt in his letter to the committee stated that the directors of the United States Rubber Co. at a recent meeting recommended that the Woonsocket Rubber Co. contribute this sum to the fund.

To Take Movies of Firestone Plant

The industrial department of the Universal Film Co. has contracted with several large concerns, including the Firestone Tire & Rubber Co., Akron, Ohio, to make industrial moving picture dramas of manufacturers' nationally advertised brands. Expert camera men, in the making of the films, go through a commercial or manufacturing plant and take thousands of pictures without disturbing any of its operations.

C. L. Brickman Chief Chemist with Rex-Hide

C. L. Brickman, formerly with the research and development laboratories of the United States Rubber Co., has been appointed chief chemist by the Rex-Hide Rubber Manufacturing Co., East Brady, Pa. Mr. Brickman is a graduate of Defiance College and the Department of Chemical Engineering of the Case School of Applied Science.

Supplies Rubber Shoes to Employes

A playing card factory in New Jersey which employs fifty men and 150 girls, supplies its employes with rubber shoes and umbrellas for use in stormy weather.

Hodge with Thermoid

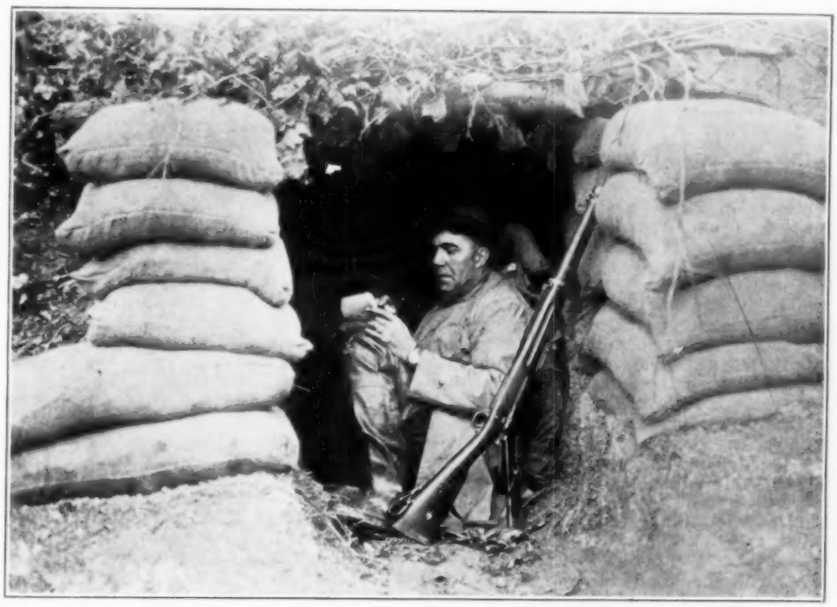
A. R. Hodge, who previously represented the United States Rubber Co. in the South, has also joined the staff of the New York branch of the Thermoid Rubber Co.

Pomeroy Commissioned Captain

C. J. Pomeroy, formerly in charge of the operating department of the Seattle branch of the B. F. Goodrich Co., has been commissioned captain in the United States Army. He will be stationed at Camp Lewis.

Gasoline Substitute

Speculation respecting Louis Enricht's assertion that he has invented a cheap substitute for gasoline has again been aroused by the announcement in the daily papers of a decision reached by the Benjamin F. Yoakum interests to attempt through legal process in the Supreme Court at Mineola, N. Y., to open Enricht's safe deposit box at Farmingdale to determine whether it contains the secret ingredient of the formula.



RUBBER BOOTS IN THE TRENCHES

Bain News Service. (C) *Committee on Public Information*

Goodyear Friars Bring Cheer to Soldiers

To raise funds with which to purchase Christmas boxes for the soldiers at Camp Sherman, Chillicothe, Ohio, the Goodyear Friars, an organization of Goodyear Tire & Rubber Co. employes, rendered a minstrel and vaudeville performance at the Armory at Akron. H. Evans Williams, tenor, topped the program with songs from the trenches.

Grubb Opens Tire Agency

R. L. Grubb, formerly with the A. B. Rathaker Rubber Co., has formed a company under the style of Grubb & Co., 905 Orange street, Wilmington, Del., which has taken over the agency for Michelin tires.

Charles G. Goodrich Commissioned

Charles C. Goodrich, director of the B. F. Goodrich Rubber Co., Akron, Ohio, and son of its founder, Dr. Benjamin F. Goodrich, is following in the footsteps of his brother, David M. Goodrich, in joining Uncle Sam's fighting forces. He has received a commission from the War Department in the ordnance branch of the service, and is scheduled to sail for France shortly.

Broughton Directs Fuel Campaign

John S. Broughton, president of the United & Globe Rubber Co., Trenton, N. J., has been notified by the United States Fuel Administration of his appointment as head of the fuel conservation movement in Mercer and Burlington counties, New Jersey.

Hunting in New Position

J. P. Hunting has been appointed special representative in charge of equipment sales of the General Asbestos & Rubber Co., Charleston, S. C. His headquarters will be in Cleveland, representing the company in the sale of Garco brake lining and other Garco products.

Litchfield Appointed to War Committee

P. W. Litchfield, vice-president and factory manager of the Goodyear tire & Rubber Co., Akron, Ohio, has been appointed by the Rubber Association of America, a member of the War Service Committee. This committee represents the rubber industry in its cooperative relations with the government, looking to the carrying out of the Government's program, as far as it affects the rubber manufacturers of the country.

Aviator Page Drowned

Ensign P. W. Page, U. S. N., at one time manager of the Portland, Me., branch of the B. F. Goodrich Rubber Co., was drowned off the coast of England recently when a seaplane in which he was manoeuvring became unmanageable and plunged into the sea, it is reported. Ensign Page joined the Naval Flying Corps on May 4, 1917. He was a graduate from Harvard in 1913.

Buys Factory Site

Rosenwald & Weil, manufacturers of backing cloth for shoes, as well as a large line of general clothing, have arranged for a new factory site on 4½ acres at Armitage and Hamlin avenues, Chicago, on which they will build a new structure to cost around $500,000.

News of the Rubber Metropolis

Goodyear Adopts Trade Acceptance Plan—Auto Dealers to Help Win War —Firestone's Practical Christmas Gift—Presents for Akron Boys— Babcox Elected Officer of Advertising Association

Goodyear Adopts Trade Acceptance Plan

In accordance with Government recommendation, and to assist, as far as possible, in relieving tense business conditions which unusual national state of affairs has brought about, the Goodyear Tire & Rubber Co., Akron, has adopted the trade acceptance plan in connection with payments for goods shipped.

The trade acceptance plan involves a time draft drawn by the seller on the purchaser for payment payable on a fixed future date.

This form of future payment settlement is not entirely new, but it has not had a wide use in this country. In Europe and particularly in Great Britain the plan has been in vogue for many years.

The trade acceptance greatly enlarges the buying field of the merchant and enables him to carry a larger stock with a limited amount of capital, and makes for a quicker turnover of his money. It is not a dating or a trade concession of any kind, but a Government-endorsed plan for utilizing available Federal Reserve funds. It is a safeguard for the merchant in these troublesome times, and in adopting it, the Goodyear company is indicating its desire to cooperate with the Government in helping to work out the innumerable industrial problems that the war has precipitated.

The plan, as applied to Goodyear business, will be used in connection with spring orders for tires, tubes, accessories and repair materials, but not for other products of the company. The Government is extremely anxious that the funds of the Federal Reserve Bank be utilized to the greatest possible extent, for its stimulating effect on the varied industries of the country, and to this end the Federal Reserve Bank is urging the use of the trade acceptance throughout the land.

The Goodyear factories are said to be running to capacity, and amply able to supply dealers with spring merchandise, utilizing the trade acceptance plan as recommended by the Government.

Firestone's Practical Christmas Gift

"Only a saving people can be ultimately successful, either individually or as a nation," declared President H. S. Firestone, of the Firestone Tire & Rubber Co., Akron, Ohio, in announcing the Christmas gift of the company to each employe at Akron, of a bank book with a credit of $1.00 deposited in a local bank. More than 10,000 people, ranging from department heads to the newest office boys, shared in this distribution. Each employee in the fifty branches outside of Akron, was given a $1.00 Thrift Stamp.

Akron Coal Situation Acute

That the coal situation in Akron is still acute is evidenced by the fact that the Northern Ohio Traction & Light Co. has been forced to notify nearly 600 industrial establishments that electricity for power purposes must be discontinued. However, the Goodrich, Firestone, Goodyear and Miller rubber plants will not be effected as these companies have coal of their own and are loaning it to the power company.

Auto Dealers to Help Win War

Akron automobile dealers are urged by A. O. Wood, president of the Akron Automobile Trade Association, to bend every effort to assist the Government in conserving national resources and completing highways of military importance.

"The entire automobile trade must realize that we are up against the greatest war in history and that while conditions are going to remain good certain adjustments must be made," said Mr. Wood. "We have got to change our methods of doing business. We must be less wasteful and watch the corners more closely.

"The war has contributed more to the upbuilding and stabilizing the automobile business than any other single factor. The truck business has come to stay as a result of what the Allied armies have learned about motorized transportation. Many mechanical refinements in passenger cars have likewise been the outgrowth of war experiences.

"One thing the war has done is to prove that the automobile is no longer a pleasure vehicle, but a utility of the greatest necessity. Customers tell me that the last thing they can afford to economize on is their automobiles, because they are using their machines at least nine-tenths for business purposes and scarcely one-tenth for pleasure.

"The war in similar manner has given a tremendous boost to the good roads movement. Officials today see more clearly and readily than ever before the wisdom of connecting up important highways instead of building them piecemeal as has been customary in the past."

Cables to Goodrich Employes in France

(Special Akron Correspondence.)

The following cablegram of felicitation has been sent by the 22,000 employes of The B. F. Goodrich Company to their comrades employed in the Goodrich factory at Colombes, France:

"The officers and employes of The B. F. Goodrich Company send their best compliments and wishes to the French Goodrich company for the coming year, for the success of the allied armies in the ranks of which are 1600 American Goodrich employes who are striving to bring nearer the permanent disablement of the 'boches' at the same time their 22,000 comrades support the war."

Most of the rubber workers abroad are Legion of Honor men who have been invalided out of active service by wounds.

A. R. Miller Transferred

Allen R. Miller of the B. F. Goodrich Co.'s railroad sales department at Akron, Ohio, has been transferred to the company's branch at 1780 Broadway, New York, as eastern representative.

Goodrich Enlistments

Employes of the B. F. Goodrich Rubber Co., Akron, Ohio, have been enlisting so rapidly that the corporation has had difficulty in filling vacancies in some departments. The latest tabulation shows that 1,634 men have joined the colors.

Goodyear $15,000,000 Stock Issue

In explaining a new $15,000,000 issue of eight per cent. cumulative second preferred stock by the Goodyear Tire & Rubber Co., Akron, Ohio, President F. A. Seiberling says:

The company did a gross business in the fiscal year just finished of $111,000,000, and has the capacity and equipment to produce, at present prices, a gross business of $200,000,000. We were of the opinion that, due to war conditions, business might be retarded during the coming year, but our sales in November and December of this year have been more than fifty per cent greater than for the same period last year, indicating that the company's business for 1918 might exceed $150,000,000.

While less than one per cent of our 1917 out put was war business, the Government now requests us to take on war business in considerable volume, which necessitates a greatly increased supply of raw materials. Our supply of crude rubber is secured mainly from Singapore, and as ocean shipping is irregular and uncertain at present, we are compelled to carry larger stocks and make advance purchases far beyond normal requirements.

The sale of $15,000,000 second preferred stock will enable us to take care of our ever increasing business with larger profits for the company and greater security to the preferred stockholders as well as larger earnings for the common stockholders.

The company is asking authority to increase its capital stock $50,000,000, half preferred and half common, giving it an authorized capitalization of $100,000,000.

Presents for Akron Boys

(Special Akron Correspondence.)

Were all corporations as thoughtful of their boys at the front as the rubber manufacturers, the seed of respect of employe for employer would be so deeply implanted that, after the great struggle danger of friction would be removed for all time. Social organizations of The B. F. Goodrich Rubber Company, the Goodyear Tire & Rubber Company and the Firestone Tire & Rubber Company united a week before Christmas and staged a big entertainment from which the proceeds, amounting to some $6000, went into gifts for every Akron boy in government service.

Presents were not restricted to just rubber employes. Every Akron lad in service —there are some six thousand—received something. The spirit of "all or none" was voiced by E. C. Shaw, Vice President of the Goodrich company, who, as a member of Gov. Cox's commission, has made a thorough study of conditions at all camps where Ohio boys are quartered.

Babcox Elected to Office

Edward S. Babcox, of the Firestone Tire & Rubber Co., Akron, Ohio, was elected vice-president of the Association of National Advertisers, Inc., at its eighth annual meeting in New York.

Williams Foundry Issues Stock

Roland T. Meacham, Cleveland, Ohio, is offering a $50 per share $200,000 in common stock of the Williams Foundry & Machine Co., Akron, Ohio, having joined in the purchase of this company's entire $2,000,000 issue.

Wetmore Goes with Frank Harter

Charles C. Wetmore, formerly with the White Co. and the Firestone Tire & Rubber Co., has joined the staff of Frank Harter, Washington distributor of Stewart products.

Goodyear Employes Get Coal at Cost

According to company officials, over 2500 tons of coal have been sold at cost to its employes of the Goodyear Tire & Rubber Co., Akron, Ohio.

Market for Manufactured Rubber Goods

NEW YORK, Jan. 11, 1918.

The rubber trade has not yet recovered from the disturbances incident to the holidays, stock taking and other delays that always accompany the New Year and business is further retarded by the present state of disorganization of the mails and of transportation.

At the present time many rubber factories are experiencing difficulty in maintaining their rate of output on account of the shortage of fuel, and some of them have been obliged to close down altogether. The seriousness of the coal situation is occupying the minds of most manufacturers who also have other troubles. Crude rubber is plentiful and chemicals and other compounding materials can be had in sufficient quanties, but the fabric situation is not so easy, especially in the case of manufacturers of rubber mechanical goods. The visible supply of hose and belting ducks is growing smaller every day and the mills are constantly reducing their output of these fabrics for other than Government work.

Tire fabrics are still plentiful, but it is said to be difficult to place new contracts for Egyptian and Sea Island grades. Fabrics made of long domestic staples that are being substituted for these are said to be giving very satisfactory results.

Mechanical Goods

The very cold weather we have been experiencing has been a great hindrance to business and has naturally affected the rubber mechanical goods trade. Many offices and wholesale houses have been devoid of heat and in a number of instances salesmen were asked not to call on customers or attempt to do business under the prevailing condition. Little serious effort has been made, as yet this year, to get business in rubber mechanical lines, and though the general impression is that much more goods could be sold than can be produced and delivered, it is still too early to arrive at any definite conclusions.

Tires

The tire trade is in much the same position as other lines as far as the possibility of forecasting business conditions is concerned. Judging from the stability and optimism that is being shown by the automobile industry at the New York Automobile show, the tire business for 1918 promises prosperous.

During 1917, the American automobile industry produced close on to 2,000,000 machines, most of which have remained in this country and will be used here. These cars would not have been produced were they not wanted or needed by the American public which keenly recognizes the utility of the automobile; these cars are going to run and their number will be augmented by the 1918 production.

All these cars will need tires and the American rubber industry will supply them. Consequently when the large requirements for renewals are considered there is reason to believe that the optimism that is the keynote at the National Show is justified and that in spite of all difficulties the tire business in 1918 will be big and active.

As to tire prices, there is again much speculation, but it can be said that there are factors that furnish ground for the belief that tire manufacturers may well be in a frame of mind that would lead to an increase in the prices of tire casings. The high cost of cotton fabrics and the advisability of allowing wider margins for adjustments on tires made of fabrics containing cotton the use of which in tires is still somewhat of an experiment, coupled with the other increasing costs of manufacturing and selling, furnish fairly good reasons for adding to tire prices.

The scarcity of Sea Island and Egyptian cottons is forcing the fabric mills to substitute other long staple cottons, and it can be truthfully said that the new fabrics have shown very good quality, but where manufacturers are guaranteeing mileage they have to be careful when they are obliged to use materials with which they are not over familiar and which have not received the practical test of time.

Druggists' Sundries

Factories engaged in the manufacture of druggists' sundries are busy, but the sales end of the trade has not yet found its stride; it is still feeling the after-effects of the holidays, but even more the severe weather and the consequent delays and disorganization of business. However, this year promises well to be a good one in this line of rubber manufacture.

Footwear

Rubber footwear manufacturers continue to be exceedingly busy and the wholesale and retail trades are taking all the goods they can get. The labor situation is somewhat easier, but the coal problem is acute, just as it is also in other lines of rubber manufacture. Nevertheless, manufacturers predict that they will produce and sell more footwear this year than in any previous twelve months of their existence. Army requirements of footwear promise to be large.

Increases, effective Jan. 1, are announced by manufacturers of rubber footwear. The United States Rubber Co., as an instance, has raised prices for arctics and all goods with cloth uppers 25 per cent. The increase for boots and gum shoes is about 14 per cent. The average increase for this class of goods is from 16½ to 17 per cent.

The Fabric Market

NEW YORK, Jan. 11, 1918.

Another high record was made in the New York raw cotton market on Jan. 9, when Middling Uplands were quoted 33.30, three pounds for a dolar. The causes were identical with those that brought about previous weekly advances, constant buying by trade interests, slow selling by Southern holders, absolute lack of storage facilities in New York, and revived expectations of peace.

Egyptian Cotton

The latest report by mail from Alexandria is dated November 30 and shows a firm future market there. The order of the military authorities prohibiting the export of cotton from Egypt, except under license, had only a temporary effect on values, for it was soon realized that the object of the prohibition was that the distribution of Egyptian cotton crop among the various countries should be controlled in the interests of the Allies.

The report shows that shipping facilities had been satisfactory, the export shipments averaging 20,000 bales a week.

The spot market had been fairly active for Upper Egypt qualities; for Sakellarides the demand was small, at prices somewhat easier. There were no shipments to America direct.

As the situation now is, it is apparent that Egyptian cotton wil not be a factor in the 1918 production of automobile tire fabrics in America; Sea Island and other American long staple cottons will take its place almost entirely.

Sea Island

The cotton market in Savannah has been very quiet, holders have shown no anxiety to accept lower than quotations and, as all their cotton has been bought at high prices, it will still take several weeks of quiet market before they will be willing to turn loose at a concession. Meanwhile, the mills are meeting with good results with the staples they are using to take the place of Sea Island.

Yarns

The cotton-yarn market is strong and the demand for many coarse numbers for Government work is much in excess of the supply and it is reported that bids are being made at unusual prices to get spinners to increase the orders they have in hand. Production is below normal.

Fabrics

The fabric situation promises to grow more and more serious. The troops in the field are increasing every day and every day the Government's demands for all kinds of fabrics grows larger and these demands are already in excess of the supply. The coal shortage throughout the country has already resulted in a substantial curtailment of the output of textile mills and this will be felt soon, for it will take some time to stock up the mills that have run short on their production.

Tire Fabrics

The tire-fabric market is quiet, inquiries being fewer than is usual at this time of the year. Prices, however, are firm. Egyptian cotton will not be a factor in tire fabrics this year for the number of bales of this staple that are reaching this country is negligible. Sea Island cotton also will not occupy the position it has occupied in former years. The crop is not as large as was expected and the mills are meeting success with fabrics made of other long staple American cottons.

The mill men feel that there will be a shortage of tire fabrics before the year is over, for they expect tire factories to get back into their stride by March and they know that many of them have not covered all their requirements for the year.

Hose and Belting Fabrics

The situation in mechanical ducks is becoming more pressing every day. The production of the mills for private account is decreasing daily, due to the growing demands of the Government. The rubber manufacturers, however, appear to be more worried with the shortage of coal than with the fabric situation and mill men report few inquiries. Quotations are nominal.

Drills, Osnaburgs and Sheetings

The demand for these fabrics is in excess of the supply, due chiefly to the large demand among bag manufacturers which are using cotton instead of burlaps that are too costly and scarce. Prices quoted are, in many instances, nominal.

Garment Cloth

It is reported that the Government is considering new samples of uniform twills in 20-ounce weights, all worsted, and it is said that the new cloth will last three times as long as the old standard cloth and will be much warmer.

The wool market is reported very firm and it is said the increasing Government regulation of the wool trade is beginning to have a serious effect upon many mercantile institutions.

Burlaps

The demand for burlaps is better than it has been recently and spot holders are

firm on the prices they demand for their goods. Reports from Calcutta all indicate a very strong condition there. Stocks are large, but the difficulty is in getting them abroad. Goods afloat for January are said to be fairly well covered by orders.

NEW YORK QUOTATIONS

TIRE FABRICS.	
17¼-ounce Sea Island, combed, sq. yd.	$1.62@1.73
17¼-ounce Egyptian, combed	1.24@1.60
17¼-ounce Egyptian, carded	1.30@1.35
17¼-ounce Peelers, carded	0.75@1.13
17¼-ounce Peelers, combed	1.00@1.05
MECHANICAL DUCKS	
Hose (nominal)	0.58@ .65
Belting (nominal)	0.57@ .65
DUCKS	
Single Filling (pound basis) lb.	.58
Double Filling (pound basis)	.65
DRILLS	
37-inch 2.35-yard yd.	.26
37-inch 2.75-yard	.22
37-inch 3.00-yard	.19
37-inch 3.25-yard	.17¾
37-inch 3.50-yard	.17
37-inch 3.95-yard	.15½
38-inch 2-yard Southern lb.	.50
38-inch 2.00-yard Northern	.54
40-inch 2.47-yard Northern yd.	.23
40-inch 2.47-yard Northern	.27
52-inch 1.90-yard Southern	.28
52-inch 1.90-yard Northern	.29
52-inch 1.95-yard Southern	.27
52-inch 1.95-yard Northern	.29
60-inch 1.52-yard Southern	.34
60-inch 1.52-yard Northern	.34
SHEETINGS	
40-inch 2.35-yard yd.	.24
40-inch 2.50-yard	.23½
40-inch 2.85-yard	.21
40-inch 3.00-yard	.17
40-inch 3.25-yard	.18
40-inch 3.60-yard	.17¾
40-inch 3.75-yard	.17½
40-inch 4.25-yard	.15
38-inch Jacket Cloths yd.	20-22
TWILLS FOR PROOFING	
37-inch 2.85-yard yd.	.20
37-inch 3.25-yard	.25
37-inch 2.10-yard	.29
COTTON STOCKINETTES (52-inch)	
E—11½-ounce yd.	.80
A—11 -ounce	.65
BURLAPS (Spot Carload Lots)	
40-inch 8 -ounce	$16.50
40-inch 10 -ounce	20.25
40-inch 10½-ounce	20.50

Chemicals and Compounding Materials

NEW YORK, January 11, 1918.

Rubber manufacturers showed more interest in the market covering deliveries extending over the first quarters and in some instances over the first half of the year. Zinc oxide producers report that they are well sold up on the 10¼c. basis announced recently. The antimony products are moving steadily into consuming channels and prices are being well maintained. Aniline oil sold in a fairly large way at 29c. per pound, drums included, equal to approximately 27c. in bulk. Benzol is being offered freely at easier quotations, especially covering distant deliveries. Selling pressure is noted in the market for caustic soda and prices closed sharply lower. The situation in sulphur remains strong as stocks here are moderate, due chiefly to the difficulty in moving supplies from the mines. English vermilion advanced, in sympathy with the higher cost of production.

ANTIMONY SULPHURETS

While the market for the metal went off this had little or no influence on the sulphurets. Leading operators report a steady market for all of the standard grades. Red sulphuret closed nominally at 25 to 26c. per pound, with golden at 28 to 30c. and the crimson at 45 to 52c.

ANILINE OIL

There was a better demand for aniline oil and in some quarters prices were quite firm. Some off-grade material was offering at concessions. Large producers report that they sold several round-lots of pure aniline oil on the basis of 29c. per pound, drums included. Bulk quotations ranged from 26 to 27c. per pound, as to quantity and seller.

BENZOL

Contract business was up to expectations, but with production increasing selling pressure was noted in some quarters and the undertone of the market continued easy. Leading producers offered pure benzol in a large way on the basis of 40c. per gallon, immediate shipment, and at 35c. per gallon for contract.

CAUSTIC SODA

The market went off sharply on reselling of parcels originally destined for export. Sales of several round lots were noted at 6c. and 6¼c. per pound, although nominal asking prices at the close ranged from 6¼c. to 6½c. per pound.

COLORS

Blacks are strong on the spot. The demand is active and most of the producers are well sold up. Rubber makers' blacks are held at 4¾c. to 6¼c. per pound. English vermilion has advanced to $1.95 minimum, the uplift being due to higher cost of basic materials.

LEAD PIGMENTS

The market for pig lead has been advanced, but this brought out no change in the various lead pigments. The market for Sublimed blue and white lead is quoted on the basis of 8½c. to 9c. per pound. Lithopone held at 6½c. to 7c. per pound.

SULPHUR

Producers are tied up by the shipping situation and some of the leading factors in crude refuse to take on any new business until supplies can be moved more freely from the mines. This naturally affects the refined grades, and while prices are nominally unchanged, the position of the market is strong. Refined is held on the basis of $3.85 per 100 pounds, in barrels, car-lots.

ZINC OXIDE

A good volume of business has been done on the recently announced contract basis of 10¼c. per pound for the XX and Horsehead brands. No further price changes have been named by producers.

Prices Current for Chemicals, Fillers, Colors, etc.

Acetone lb.	.39	@	.40
Acids, Acetic, 28% lb.	.05½	@	.06
Carbolic, C. P. lb.	.55	@	.55½
Cresylic, 95% gal.	1.10	@	1.15
Muriatic, 20 deg. lb.	.02	@	.02¼
Muriatic, 22 deg. lb.	.02½	@	.02⅝
Nitric, 40 deg. lb.	.08½	@	.08¾
Nitric 42 deg. lb.	.09¼	@	.09½
Sulphuric, 60 deg. lb.	.01¾	@	.02
Tartaric, crystals. lb.	.78½	@	—
Aluminum Flake ton	22.00	@	24.00
Aniline oil, bulk basis lb.	.26	@	.27
Antimony, metal, spot lb.	14.25	@	14.50
Oxide lb.	15.00	@	16.00
Sulphuret, red lb.	.25	@	.26
Sulphuret, golden lb.	.28	@	.30
Sulphuret, crimson lb.	.45	@	.48
Asbestos ton	40.00	@	60.00
Asphaltum, Egyptian lb.	.22	@	.28
Domestic ton	20.00	@	26.00
Barium sulphate, technical lb.	.04¼	@	.04¾
Chloride lb.	.04	@	.05
Barytes, prime white imported ton	*38.00	@	42.00
white, domestic ton	30.00	@	33.00
off color, domestic ton	20.00	@	22.00
Benzol, pure gal.	.40	@	.42
Beta-naphthal, sublimed lb.	.85	@	.90
unsublimed lb	.65	@	.70
Blacks, Drop lb.	.08	@	.15
Ivory lb.	.16	@	.30
Carbon gas lb.	.22	@	.28
Lampblack R. M. lb.	.04¾	@	.06¼
Mineral blacks ton	24.00	@	28.00
Blues, Prussian lb.	.65	@	1.35
Soluble (potash) lb.	1.45	@	1.75
Ultramarine lb.	.18	@	.35
Browns,			
Umber, Turkey, burnt, powdered lb.	.04	@	.05
American, burnt lb.	.03	@	.03½
Cadmium sulphide, yellow lb.	2.25	@	2.50
Carbon, bisulphide, bulk lb.	.07¼	@	.07¾
tetrachloride, drums lb.	.15½	@	.16
Caustic Soda, 76@78% lb.	.06¼	@	.06½
Chalk, precipitated, extra light lb.	.05	@	.05¾
light lb.	.04¾	@	.05¼
heavy lb.	.03¾	@	.04¼
China clay, domestic ton	18.00	@	22.00
imported ton	25.00	@	35.00
Fossil flour lb.	.06	@	.10
Gilsonite ton	40.00	@	44.00
Glue, extra white lb.	*.35	@	.45
medium lb.	*.30	@	.35
low grade	*.25	@	.30
Glycerine, C. P. (drums) lb.	.67½	@	—
Graphite, flake (bbl.) lb.	.15	@	.20
powdered (bbl.) lb.	.10	@	—
Green, chrome, R. M. lb.	.12	@	.20
Ground glass (fine) lb.	.03	@	—
Hexamethylene lb.	.95	@	1.05
Infusorial earth, powd'd. ton	60.00	@	—
bolted ton	70.00	@	—
Iron oxide, red, reduced grades lb.	.04	@	.05
red, pure, bright lb.	.12	@	.14
Lead, red oxide of lb.	.10	@	.10½
sublimed blue lb.	.08½	@	.09
white, basic carb. lb.	.09	@	.09½
white basic sulph. lb.	.08½	@	.09
Lime flour lb.	.01½	@	.01¾
Litharge lb.	.09½	@	.10
English lb.	*.12	@	.13
sublimed lb.	.09¼	@	.09¾
Lithopone, domestic lb.	.06½	@	.07
Magnesia, carbonate lb.	.12	@	.14
calcined, heavy lb.	.12	@	—
calcined, light lb.	.70	@	—
Magnesite, calcined, pwd. ton	65.00	@	70.00
Mica, powdered lb.	.03¾	@	.05
Mineral rubber (asphaltum base) ton	40.00	@	60.00
Naphtha, motor gasoline, (steel bbls.) gal.	.24	@	—
68 @ 70 degrees (steel bbls.) gal.	.30	@	—
70 @ 72 degrees (steel bbls.) gal.	.31	@	—
73 @ 76 degrees (steel bbls.) gal.	.33	@	—
machine (wood bbls.) gal	.41	@	—
Oil corn, crude cwt.	18.65	@	—
corn, refined cwt.	22.35	@	22.65
linseed (bbl.) gal.	1.28	@	1.30
palm, Lagos lb.	*.31	@	.31½
pine, yellow gal.	.44	@	.45
rapeseed, refined gal.	1.65	@	1.70
rapeseed, blown gal.	1.70	@	1.75
rosin, first rectified. gal.	.42	@	.43
tar (commercial) gal.	.30	@	.32
Orange mineral, American. lb.	.13	@	.13½
imported lb.	*.15	@	.20
Petrolatum, bbls., amber lb.	.05	@	.05¼
pale yellow lb.	.05¼	@	.05½
Pipe, tar, retort bbl.	15.25	@	15.50
Pitch bbl.	4.25	@	4.75
Plaster of paris bbl.	2.00	@	2.50
Red, Tuscan lb.	.22	@	.30
Indian (reduced) lb.	.06	@	.08
Standard lb.	.08	@	.11
Rosin (common to good), @ 280 lbs. bbl.	6.75	@	6.95
Rotten stone, powdered lb.	.03	@	.04½
Rubber substitute, Black lb.	.11	@	.15
white lb.	.14	@	.16
brown lb.	.16	@	.17
Shellac, fine orange lb.	.66	@	—
T. N. lb.	.58	@	.59
Bleached, ordinary lb.	.56	@	—
Bleached, bone dry lb.	.66	@	.67
Silex (silica) ton	24.00	@	34.00
Soapstone, powdered ton	12.00	@	20.00
Starch, corn, powdered lb.	.05¾	@	.06½
Sulphur, crude ton	*50.00	@	..
refined, flour, per 100-pounds, in bbls.	3.85	@	4.40
roll	3.70	@	4.15
commercial	3.35	@	3.65
Talc, American ton	12.00	@	16.00
French ton	22.00	@	30.00
Toluol, pure, in drums gal.	*3.50	@	5.00
Tripolite earth ton	60.00	@	65.00
Turpentine, pure gum—spirits gal.	.47	@	.47½
wood gal.	.42	@	.43
Venice, artificial gal.	.12	@	.13
Vermilion, English lb.	1.95	@	2.00
Wax, beeswax, crude yel. lb.	.35	@	.37
ceresin, white lb.	.18	@	.19
carnauba, No. 3 lb.	.48	@	.49
Montan lb.	*.35	@	.40
ozokerite, black lb.	.75	@	.80
ozokerite, green lb.	*.85	@	.95
Paraffin, refined, 118/120 M.P. (bbls.) lb.	.11	@	.11¼

Wax, paraffin, 123/125 M.P. lb.	.12	@	.12¼
128/130 M.P. lb.	.12¼	@	.12½
133/136 M.P. lb.	.13	@	.13¼
Crude, 120/122 M.P. lb.	.08¾	@	.09
124/126 M.P. lb.	.09	@	.09¼
Whiting, commercial cwt.	.95	@	1.10
Alba cwt.	1.00	@	—
Paris, white, American cwt.	1.25	@	—
English cliffstone cwt.	1.50	@	—
Yellow chrome lb.	.22	@	.28

Zinc oxide, American process, horsehead brand lb.	†.10¼	@	.10½
selected lb.	†.10¾	@	.11
"XX red" lb.	†.10¼	@	.10½
French process, green seal lb.	†.13½	@	.13¾
red seal lb.	†.13	@	.13¼
white seal lb.	†.14	@	.14¼
Zinc substitutes ton	30.00	@	35.00
Zinc, sulphide, pure lb.	*.07½	@	.08

†Contract prices. *Nominal.

The Crude Rubber Market

NEW YORK, Jan. 10, 1918.

The tendency of prices in the market for crude rubber was upwards. Covering by shorts during the last week in December started an upturn in values for plantation grades. This was followed by increased activity on the part of manufacturers, and while the demand during the last few days has subsided, the market at the close was on a fairly steady basis. Spot stocks have been reduced materially, and since most of the plantation rubber is now being shipped via the Pacific coast, the rail congestion is retarding the movement of the gum to eastern points. According to members of the trade shipments from Pacific coast points are underway from one to two months, whereas formerly it was a question of a few weeks only to bring supplies to New York. This has already had the effect of sending spot prices for plantation rubber to higher levels than futures. Under the abnormal transportation conditions the market has been in a more sensitive position and some sharp price fluctuations were witnessed.

Three weeks ago first latex pale crepe was held at 55c per pound, but at the close today 58c was the general quotation for spot rubber. During the interval, however, first latex touched 61c per pound, the highest price in many months. First latex pale crepe for March-June delivery closed at 56½c per pound, while the July-September position closed at 53c per pound. Ribbed smoked sheets on spot settled at 57c, with March-June at 55c and July-September at 54½c per pound. Importations of plantation rubber have been quite large and stocks on the coast are said to be liberal. The proposition confronting the trade is to move these supplies, and as this is being done under great difficulty, a temporary shortage at eastern points is not unlikely to occur at any time. The recent buying by manufacturers was prompted largely by a desire to carry a fairly large reserve stock so as to be on the safe side.

Brazilian descriptions of crude rubber show little change contrasted with a fortnight or so ago. Para up-river fine held at 61c per pound, nominal, throughout the period under review, and this price was asked for shipments extending over the next six months. Medium up-river advanced 1c per pound, closing at 54c, while coarse went off slightly to 40½c per pound. Caucho ball was offered on a parity with up-river coarse. Increased activity was noted in Islands fine, and for a time prices showed a higher range. The market went off again towards the close, with the price settling at 50c. Islands coarse and Cameta held at 26 to 27c per pound.

Centrals were firmly maintained under light offerings, Corinto, prime, closed at 40c per pound, a net gain of 2c over the previous basis. Other grades of Central American rubber showed similar gains. Guayule was steady at 28@29c per pound, with the demand moderate only. East Indian gums closed nominally unchanged.

	Spot.	Mar.-June.	July-Sept.
Para—Up-river fine lb.	61	61	61
Up-river medium	54	54	..
Up-river coarse	40½	..	..
Caucho ball	40½	..	..
Islands fine	50	..	..
Islands coarse	26	..	..
Cameta	26½	..	..
Medeira fine	64	..	..
Ceylons-Smoked sheets, ribbed	57	55	54½
Smokers sheets, plain	56	54	53½
First latex pale crepe	58	56½	56
Amber crepe	55	53	52½
Clean brown crepe	52	50	49½
Centrals—Corinto, prime	40	..	..
Esmeralda, prime	39½	..	..
Mexican scrap	38½	..	..
Balata, sheets	82	..	..
Balata, block Panama	56	..	..
Guayule	28	..	..
Africans—Rio Nunez, string	*62	..	..
Massai, red	*48	..	..
East Indian Pontianak	12	12	..
Palembang	12¼	12¼	..

* Nominal.

Scrap Rubber

New York, Jan. 11, 1918.

Reports from scrap rubber dealers show that business in this market is still extremely light and prices remain very easy without any change worth mentioning.

The following prices were paid for scrap rubber delivered at the reclaiming mill:

Boots and shoes	8¾	@	9
Arctics, trimmed	7	@	7¼
Arctics, untrimmed	5½	@	6
Tires—Automobile	4¾	@	5
Bicycles, pneumatic	4¾	@	5
Mixed hose	2	@	2¼
Air brake	4¾	@	5
Inner tubes, No. 1	20¾	@	..
Inner tubes, No. 2	10½	@	..
Red	10½	@	..

Crude Rubber Imports

IMPORTATIONS OF CRUDE RUBBER INTO THE UNITED STATES DURING DECEMBER, 1917

Figures compiled by The Rubber Association of America, Inc., 17 Battery Place, New York City. (Estimated net weights.)

PLANTATIONS

From	Tons
Liverpool	117
Hull	7
London	105
Singapore	536
Colombo	109
Batavia	540
British India	71
Japan and other countries	1,561
	3,046

MANICOBAS AND MATTO GROSSO

Manaos	7

AFRICANS

From	Tons
Liverpool	13
Hull	44
Bordeaux	20
Lisbon	32
	109

CENTRALS AND GUAYULE

Central (Mexico and Central America)	118
Guayule (Mexico)	196
	314
Manaos	163
Para	1,588
	1,751

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

	Tons		Tons
Waste	287	Balata	32
Reclaimed rubber	24	Miscellaneous	181

Comparisons 1916-1917

	Dec., 1916 Tons	Dec., 1917 Tons
Plantations	9,042	3,046
Paras	2,123	1,751
Africans	508	109
Centrals	194	118
Guayule	11	196
Manicobas and Matto Grosso	155	7
	12,033	5,227

Monthly Importations of Crude Rubber During the Year 1917

	Tons		Tons
January	12,788	August	17,290
February	10,162	September	13,664
March	18,624	October	8,970
April	13,000	November	13,611
May	18,411	December	5,227
June	15,096		
July	12,676	Total for year	159,519

Arrivals Plantation Rubber for December, 1917, Showing Ports of Origin and Destination

From	Arrived at	Tons
Singapore	Port of Cleveland	488
Singaport	San Francisco	48
British India	Port of Cleveland	18
British India	New York	53
Batavia	San Francisco	540
Hull	New York	7
London	New York	100
London	Boston	5
Liverpool	Boston	5
Liverpool	New York	112
Japan	Seattle	1,561
Colombo	New York	109
		3,046

* Including other countries.

ARRIVALS OF PLANTATIONS BY PORTS

	Tons	Tons	Tons	Tons
Atlantic Ports:				
Boston	10			
New York	381			
			391	
Pacific Ports:				
San Francisco	588			
Seattle	1,561			
			2,149	
				2,540
Port of Cleveland				506
				3,046

Monthly Comparisons

PLANTATIONS

	Tons
January	9,532
February	7,224
March	13,838
April	9,933
May	16,411
June	10,801
July	10,480
August	15,158
September	11,192
October	7,309
November	12,479
December	3,046
Total	127,403

PARAS

	Tons
January	2,123
February	1,977
March	3,981
April	2,612
May	994
June	3,746
July	1,889
August	1,760
September	2,133
October	1,398
November	861
December	1,751
Total	25,225

AFRICANS

	Tons
January	642
February	660
March	340
April	212
May	656
June	323
July	49
August	108
September	151
October	23
November	57
December	109
Total	3,330

CENTRALS

	Tons
January	237
February	138
March	50
April	70
May	47
June	43
July	144
August	23
September	7
October	18
November	3
December	118
Total	898

GUAYULE

	Tons
January	110
February	49
March	277
April	153
May	187
June	86
July	105
August	194
September	175
October	120
November	211
December	196
Total	1,863

MANICOBA AND MATTO GROSSO

	Tons
January	144
February	114
March	138
April	20
May	116
June	97
July	9
August	47
September	6
October	102
November	—
December	7
Total	800

TOTALS

BY MONTHS

	Tons
January	12,788
February	10,162
March	18,624
April	13,000
May	18,411
June	15,096
July	12,676
August	17,290
September	13,664
October	8,970
November	13,611
December	5,227
Total	159,519

BY GRADES

Plantations	127,403
Paras	25,225
Africans	3,330
Centrals	898
Guayule	1,863
Manicoba and Matto Grosso	800
Total	159,519

American Rubber Patents

ISSUED DECEMBER 18, 1917.

1,250,161—To Walter R. Green, Chicago, Ill. Tire-carrier.

1,250,180—To Harry C. Hughes, Cincinnati, Ohio. Tire-tool for automobiles.

1,250,223—To Edward W. Rawdon, Akron, Ohio. Inner tube for elastic vehicle-tires.

1,250,338—To Edward Nall, Akron, Ohio, assignor to the Goodyear Tire & Rubber Co., Akron, Ohio. Machine for making flaps for pneumatic tires.

1,250,405—To Joseph S. Williams, Riverton, N. J. Resilient tire.

1,250,418—To Russel Dean Belden, Akron, Ohio, assignor to The Miller Rubber Co. Akron, Ohio. Artificial sole-stock or composition material.

1,250,504—To William F. Ray, Chicago, Ill. Core or mandrel.

1,250,510—To William J. Robinson, Denver, Colo. Tire.

1,250,633—To Ernest J. Oetter, Denver, Colo. Resilient tire.

1,250,710—To Denman C. Taylor, Miller, Nebr. Tire-armor.

1,250,781—To John Blair, Jr., Rock Springs, Wyo. Tire-tread.

1,250,828—To William Felstead, Victoria, British Columbia, Canada. Shoe-heel.

1,250,866—To Isaac Harrison, Pittsburgh, Pa. Antiskidding device.

1,250,911—To Daniel D. Lyons, Farmington, Minn. Life-preserver.

1,250,908—To William T. Lowrey, Jr., Blue Mountain, Miss. Antislipping attachment.

1,250,916—To Nelson W. McLeod, St. Louis, Mo. Apparatus for making cord-tire skeletons.

1,250,917—To N. W. McLeod, St. Louis, Mo. Art of making cord tires.

1,250,920—To Lourissa G. Marks, Perry, Iowa. Vehicle-tire.

ISSUED DECEMBER 25, 1917.

1,250,940—To A. E. Archambeau, Marquette, Mich. Boot.

1,251,007—To W. B. Frye, Buffalo, N. Y. Overshoe attachment.

1,251,014—To Robert C. Greenerd, assignor of one-half to John W. Schaeffer, Boston, Mass. Tire-protector.

1,251,017—To Wm. H. Hann, Munden, Va. Tire.

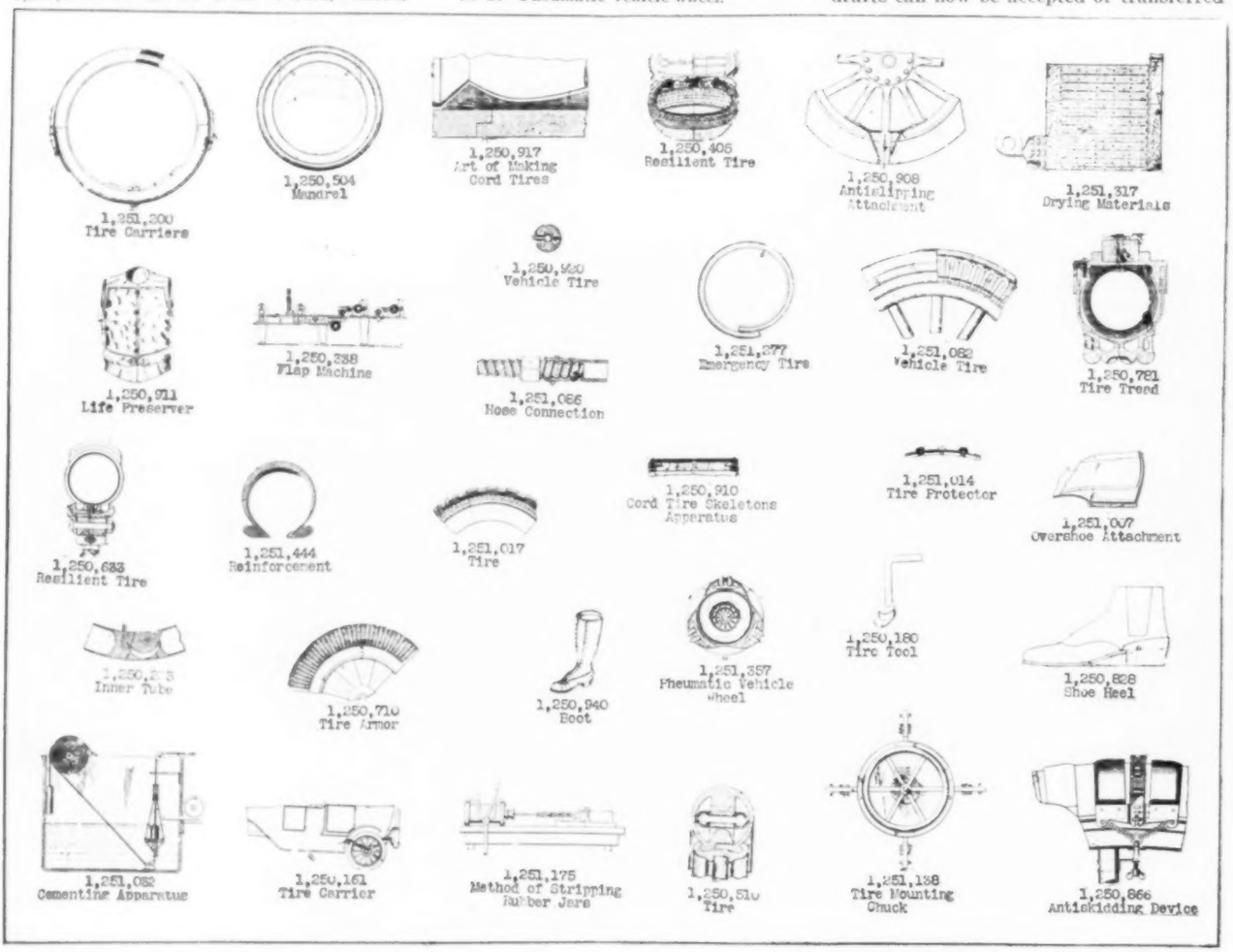
1,251,029—To Harry A. Hoffman, Akron, Ohio, assignor to the B. F. Goodrich Co., New York. Art of coating golf-balls.

1,251,444—To Charles L. Teevan, Brooklyn, N. Y. Armor or reinforcement.

1,251,401—To Johann Daniel Melchior, Scranton, Pa. Tire-armor.

1,251,032—To Clair G. Hoover, Akron, Ohio, assignor to the Goodyear Tire & Rubber Co., Akron, Ohio, a corporation of Ohio. Apparatus for cementing strands of cords.

1,251,357—To Adolph W. Eckhardt, New York, N. Y. Pneumatic vehicle-wheel.



1,251,082—To Marshal T. Miles, Chicago, Ill. Vehicle-tire.

1,251,086—To Harry Ernest Morgan, Newtown, New South Wales, Australia, assignor to James Robert Quilty, Abbotsford, New South Wales. Hose connection for air or water.

1,251,317—To Archibald F. Wright, East Orange, N. J. Art of drying materials.

1,251,277—To James G. Poe, Dallas, Tex., assignor of one-half to Andrew B. Small, Dallas, Tex. Emergency-tire.

1,251,175—To Harry L. Boyer, Trenton, N. J., assignor to Joseph Stokes Rubber Co., Trenton, N. J., a corporation of New Jersey. Method of and apparatus for stripping rubber jars from cores.

1,251,200—To Edward Egli, Riley, Ore. Tire and wheel carrier for automobiles.

1,251,182.—To Frank J. Creque, Cuyahoga Falls, Ohio. Process of ornamenting rubber articles.

1,251,138—To William C. Tyler and Glen B. Heffelfinger, Akron, Ohio, assignors to the Goodyear Tire and Rubber Co., Akron, Ohio., a corporation of Ohio. Tire-mounting chuck.

Drawing on Funds of an Enemy or Ally

The War Trade Board has authorized the payment of drafts accepted on or before Dec. 14, 1917, drawn on funds to the credit of a person who is an "enemy" or "ally of enemy," or acting for or on behalf of an "enemy" or "ally of enemy," or on which such a person appears as drawer or indorser, when such drafts are presented for payment in the United States: *Provided, however*, That when such drafts are collected for or on behalf of any person who is an "enemy" or "ally of enemy," or person acting for or on behalf of an "enemy" or "ally of enemy," the proceeds of such collection shall be at once reported by the person making such collection to and be held subject to the disposition of the Alien Property Custodian.

Attention is called to the fact that no drafts can now be accepted or transferred or dealt in before acceptance which are drawn on funds to the credit of any person who is an "enemy" or "ally of enemy," or acting for or on behalf of an "enemy" or "ally of enemy," or drawn by or to the order of such a person, or on which such person appears as indorser, unless a license is first obtained from the Bureau of Enemy Trade, Bond Building, Washington, D. C.

The War Trade Board has also authorized the payment of travelers' checks, not exceeding $100 in amount, on which there appears the indorsement of a person who is an "enemy" or "ally of enemy," or acting for or on behalf of an "enemy" or "ally of enemy," without obtaining a license therefor.

Recent Incorporations

Russel Tire Co., Newark, N. J.; capital, $100,000; incorporators: R. T. Binder, Orange, and Frank Habl and Benjamin Singer of Newark, N. J.

Onyx Raincoat Corp., New York; capital, $25,000; incorporators: N. A. Rubin, H. and S. Lesser, 667 West 161st Street, New York.

The Danubil Co., New York; capital, $50,000; asbestos, rubber products and engine room supplies; incorporators: V. Nichthauser, A. S. Pratt, J. M. Boyle, 61 Broadway, New York.

TIRE NEWS

The Automobile Show

For size, variety, and attendance, the Eighteenth Annual National Automobile Show, held at the Grand Central Palace, New York, January 5-12, was one of the most successful any previous show. Of the 346 firms exhibiting, 86 were car manufacturing companies, and 260, makers of parts and accessories. A canvass of the spaces brought out the fact that dealer, repair man and car owner.

The exhibit of tire repair supplies and inner tubes by the Keystone Rubber Manufacturing Co., Erie, Pa., was especially good, and included

MAIN ENTRANCE OF THE SHOW

automobile exhibitions ever held, and demonstrated conclusively the spirit of optimism that permeates the industry. Nor was the big show at the Palace alone remarkable in this respect for the Automobile Salon at the Astor, January 2-9, and the special displays at the various hotels were likewise uniformly successful.

The exhibition at the Palace, which was held under the auspices of the National Automobile Chamber of Commerce, may be regarded as a trade barometer, and daily readings during the seven days of the show uncovered no indications of business depression. Optimism was the keynote everywhere.

The list of exhibitors this year was larger than ever, and, furthermore, there was a waiting list of applicants who could not be accommodated. This is especially significant, inasmuch as the floor space at the disposal of the management exceeded that of this end of the show was a most conspicuous feature.

Manufacturers of tires, mechanical rubber goods, and rubber accessories, were strongly in evidence and their exhibits attracted large numbers of interested persons. A photographic reproduction of the attractive space of the Voorhees Rubber Manufacturing Co., of Jersey City, N. J., makers of laminated inner tubes, inner sleeves, reliners, outside boots, hose, rubber mallets, vulcanizing cements, gums, etc., is shown on this page. Much favorable comment was aroused by this company's interesting display.

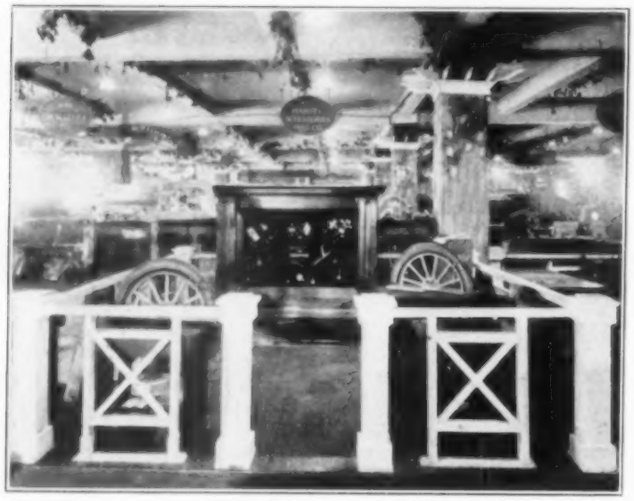
Another noteworthy exhibit was that of the Essex Rubber Co., Inc., of Trenton, N. J., featuring the well-known Essex inner tubes and accessories. The special characteristics of the products of the Essex company made its showing at the Palace of more than passing interest to the vulcanizing outfits, for use with steam, alcohol, gasoline or gas vulcanizers, vulcanizing cement, tread fillers for mending small cuts, dig-outs in the outer casing, valve bases, tube splicing materials, etc.

In the space of the Amazon Rubber Co., Akron, Ohio, this company's Amazon Supertires were displayed. Special features claimed for these tires, extra reinforcement for protection against blowouts, non-skid rolling treads, distinctive appearance, laminated inner tubes, etc., were the cause of much interest in the exhibit.

At the space of the Miller Rubber Co., of Akron, Ohio, visitors were given a little booklet, "Count the Miles," so that motorists could keep a record of the life of their tires. The Miller company is the maker of the Miller "Geared-to-the-Road" tire, for which an exclusive method of vulcanization, which retains the native vitality of the cotton fabric,

Woodworth Mfg. Co.
Grand Central Palace

Essex Rubber Co.
Grand Central Palace

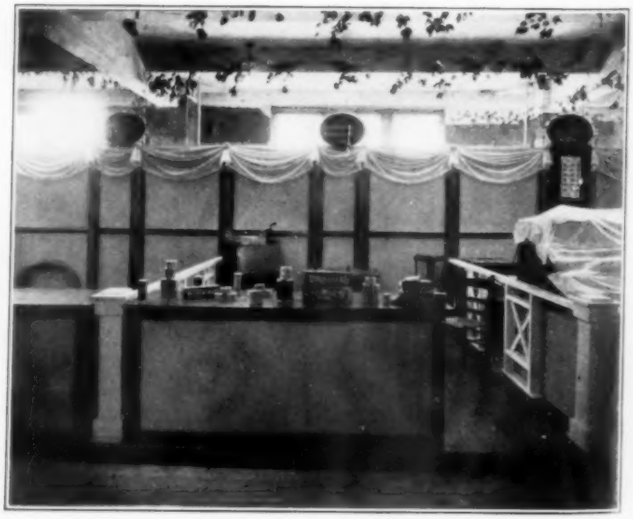


Marvel Accessories Mfg. Co.
Grand Central Palace

Tire and Rubber Exhibits

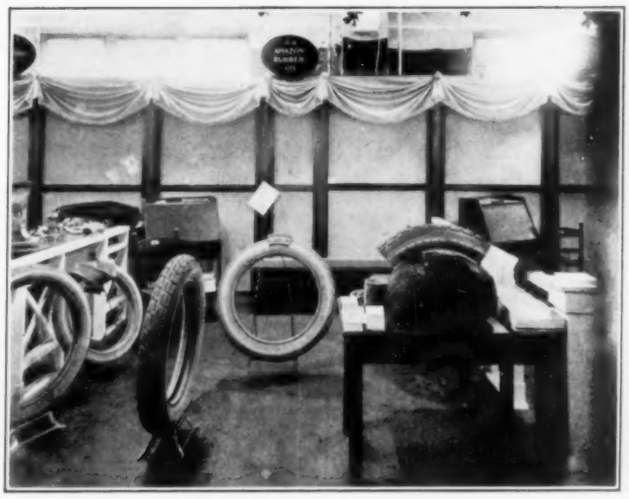
Grand Central Palace and Hotel Biltmore

A. Schrader's Son
Grand Central Palace



Keystone Rubber Mfg. Co.
Grand Central Palace

VOORHEES RUBBER MFG. CO.
Grand Central Palace

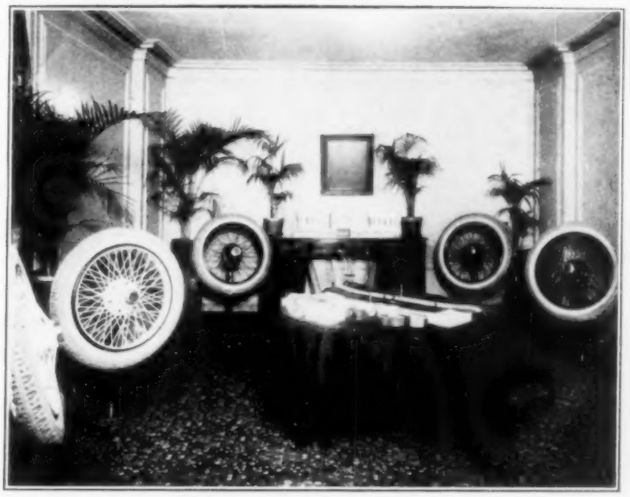


AMAZON RUBBER CO.
Grand Central Palace

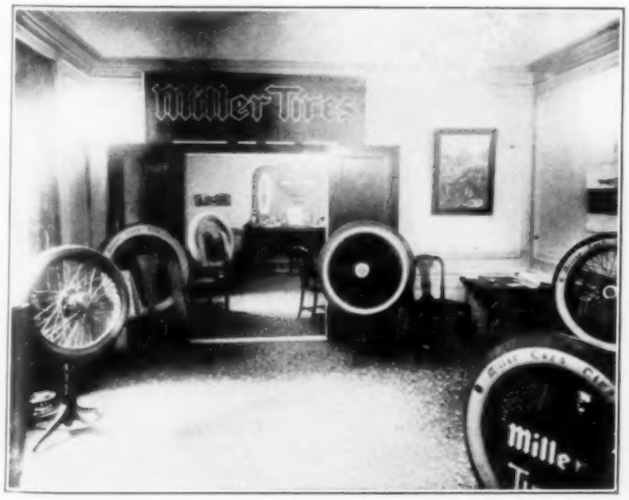
National Automobile Show

January 5-12

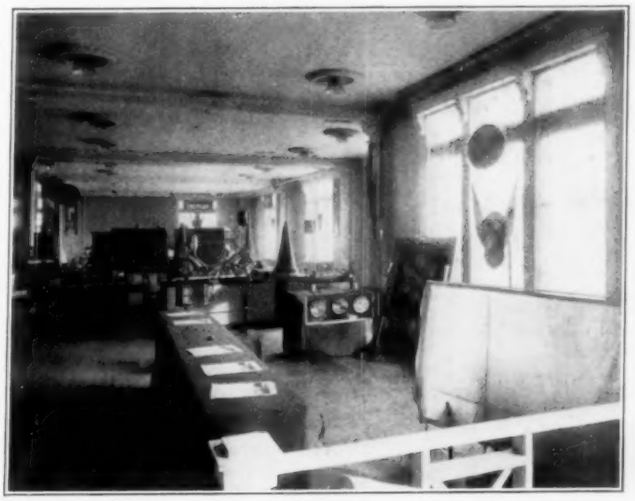
New York City



NORWALK TIRE & RUBBER CO.
The Biltmore



MILLER RUBBER CO.
The Biltmore



RAYBESTOS CO.
Grand Central Palace

is claimed in the manufacturers' literature.

Other exhibitors included the Leather Tire Goods Co., of Niagara Falls and New York, manufacturer of Woodworth treads; the Adamson Manufacturing Co., of East Palestine, Ohio, which showed its vulcanizing equipment, including vulcanizers for tubes and casings, and its popular five-minute vulcanizer for quick repair work; Sterns Tire & Tube Co., Inc., 1717 Broadway, New York, distributors of Sternwear Reinforced Pneumatic Inner Tubes; Eastern Rubber Co., 1529 Ridge avenue, Philadelphia, Pa., makers of "Magic Rubber Mend"; George H. Rives Manufacturing Co., 2187 Woolworth Building, New York, and the Auto Pedal Pad Co., Inc., 794 Seventh avenue, New York, which had interesting displays of adjustable rubber pads for use on automobile pedals.

The Essenkay Products Co., Grand avenue and Orleans street, Chicago, these manufacturers showed a brown, flexible, resilient material which is fitted into the casing, no inner tube being used, and which is claimed to possess the same easy riding qualities as the pneumatic tire, with none of its disadvantages; Marvel Tire Life Co., Kansas City, Mo.; Wonder Seal Co., 1789 Broadway, New York; Tri-Continental Corporation, Buffalo, N. Y.; Metal Stamping Co., Long Island City, N. Y.; Rowe Co., Plantsville, Conn., which showed its well-known "Prest-O-Grip" anti-skid chains for trucks; James Martin, 106 West 52nd street, New York, distributor of Smith & Gregory's patent combination auto trunk and tire carrier and other products; F. W. Stewart, 1402-04 Michigan avenue, Chicago, distributors of the Wilson adjustable rear tire holder; Clayton Co., 136-46 West 52nd street, New York, makers of the Hoover Tire Carrier; Eureka Rim Compressor, Inc., Addison, N. Y.; Pantasote Co., 11 Broadway, N. Y.

Other exhibits of special interest were the Challoner Co., Oshkosh, Wis., "Giant Grip" non-skid chains; Arrow-Grip Manufacturing Co., Inc., Glen Falls, N. Y., manufacturers of a chain non-skid device for solid tire motor trucks; Ernest D. Story, 1328 Broadway, New York, manufacturer and distributor of the Bonner inner tube; Armstrong Rubber Co. of New York, Inc., Cutler Building, Rochester, N. Y.; Coffield Tire Protector Co., 39 Cortlandt street, New York; Sterns Tire and Tube Co., Inc., 2100 Kienlen avenue, St. Louis, Mo.; Weaver Manufacturing Co., Springfield, Ill, and the Peters & Herron Dash Co., Columbus, Ohio, which showed its "Invincible" seat covering materials.

ONE VIEW OF THE MAIN FLOOR OF THE AUTOMOBILE SHOW

The Tire Equipment of Cars

The tire equipment of the different cars exhibited was interesting, particularly because comparatively few tire manufacturers were represented. The tire equipment of most of the makes on exhibition as observed by a representative of THE RUBBER AGE AND TIRE NEWS follows:

Make of Car	*Tire Equipment*
Chandler	Goodyear
Chalmers	Goodyear
Dodge	United States
Oakland	Goodyear
Saxon	Goodyear
Haynes	United States
Hupmobile	Goodyear
Mitchell	Firestone
Cadillac	United States
Velie	Goodyear
Brisco	Ajax
Marmon	United States

Make of Car	*Tire Equipment*
Nash	Goodyear
Winton	Goodrich
Grant	Goodyear
Franklin	Goodyear
Cole	Firestone
Stearns	Goodyear
National	Goodyear
Scripps-Booth	Goodyear
Crow-Elkhart	Firestone
Moline-Knight	Firestone
Monroe	Goodyear
Auburn	Goodrich
Moon	Firestone
Stutz	Goodrich
Empire	Firestone
Liberty	Goodyear
Oldsmobile	Goodyear
Paige	Firestone
King	Goodyear, Firestone
Peterson	Goodrich
Milburn	Goodyear
Chevrolet	Goodyear
Kissel	Goodyear
Stanley	Goodrich
Roamer	Goodyear
American	Goodyear
Ohio	Goodrich
Baker R&L	Firestone
Owen-Magnetic	Goodrich
Premier	Firestone
Mercer	Goodyear
Jordan	Firestone
Fiat	Goodyear
Elcar	Firestone

Make of Car	*Tire Equipment*
Buick	Goodyear
Overland	Fisk
Willys-Knight	Fisk
Packard	Goodyear
Pierce-Arrow	Goodrich
Lexington	Goodyear
Reo	United States
Hudson	Goodyear
Elgin	United States
Hal	Goodrich
Anderson	Goodrich
Columbia	Firestone
Frontmobile	Goodyear
Templar	Goodyear
Moore	Firestone
Harroun	Goodrich
Austin	Goodrich
Detroit	Goodrich
Dort	Goodyear
Peerless	Firestone, Goodyear
Allen	United States
McFarland	Firestone
Case	Goodyear
Interstate	Goodyear
Kline	Goodyear
Doble-Detroit	Goodrich
Olympian	Miller
Standard	Firestone
Hollier	Goodyear
Westcott	Firestone
Davis	Firestone
Apperson	Firestone
Schuette Sport Bodies	Pennsylvania

The Automobile Salon

The Automobile Salon in the Grand Ballroom of the Astor was a notable success, thirteen car manufacturing concerns, one coach builder, and seven makers of accessories, exhibiting. The two tire manufacturing concerns, A. Faure, 153 West Fifty-sixth street, New York, and the Dunlop Tyre Sales Co., 1808 Broadway, New York, had unusually attractive displays.

The tire equipment of the cars exhibited was as follows:

Make of car	*Tire Equipment*
Simplex	Goodrich
Daniels	Goodyear
Mercury	Empire
Brewster	Kelly-Springfield
Locomobile	Goodyear
Biddle	Goodyear
Lancia	Faure
Rolls-Royce	Goodrich
Fageol	Goodrich
Phianna	United States
White	Goodyear
Cunningham	Goodrich
Fergus	Goodyear

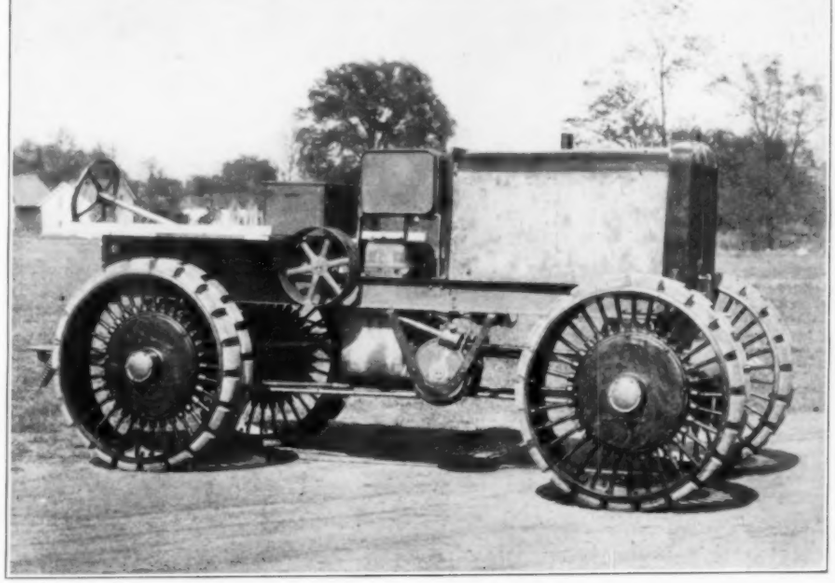
At the Biltmore and other hotels, many manufacturers of tires and accessories held special displays.

Tire Mileage Guarantees from Wholesalers' Viewpoint

Why do tire manufacturers guarantee that a tire will render so many miles of service? This question is frequently asked by wholesale dealers and jobbers in tires and automobile accessories. One manufacturer advertises very extensively that he guarantees his tires for a certain mileage; while another manufacturer will advertise extensively guaranteeing a still greater mileage. A shoe manufacturer or the maker of an anti-skid tire chain never thinks of guaranteeing any mileage for his product and no one expects such a guarantee. Why should it be different with a tire manufacturer?

Tire mileage guarantees are one of the greatest sources of trouble and loss for jobbers, many of whom have come to believe that tire manufacturers must make real profits from mileage adjustments or that the practice would have discontinued long ago. This subject received considerable attention at the annual convention of the National Hardware Association which was held recently at Atlantic City, N. J.

In the course of discussions, A. H. Nichols of Buhl Sons Co., Detroit, Mich., wholesale dealer in hardware and automobile accessories, said that he could not understand why tire manufacturers made mileage guarantees their strong point. He said that a knife manufacturer did not guarantee that a pocket knife would cut a definite number of times, but he guaranteed a knife to be free from all imperfections, and as a result hardware people had very little difficulty in satisfying customers when trouble arose. With tire mileage guarantees the jobber handling tires is obliged to make unnecessary adjustments which all too often result in the loss of good friends and accounts. These guarantees cause a loss to the jobber in every instance where the manufacturer fails to make a satisfactory adjustment. In such cases the dealer is either forced to make a politic adjustment at his own expense or lose his customer. Tires constitute only one of the many items the jobber has to sell and he cannot afford to lose a good customer through mileage adjustment difficulties. When the customer knows that he has not received the guaranteed mileage he is not disposed to listen to talks about wheels out of alignment or improperly inflated tires. Mr. Nichols believed that, if tire manufacturers wished to encourage the sale of tires through



TRACTOR WITH KELLY-SPRINGFIELD SECTIONAL BLOCK TIRES

jobbers, they should discontinue mileage guarantees and substitute for them guarantees that would insure the customer against low mileage due to imperfections in materials and workmanship.

F. R. Goodell of the Converse Rubber Shoe Co., Malden, Mass., said that he did not believe that the tire manufacturer made an unqualified guarantee of his goods. He never had seen a guarantee that was not qualified by a statement regarding normal use and abuses to which tires can be subjected, knowingly or unknowingly. The only reason for a guarantee was the fact that there must be a means of measuring the differences in tire prices. One tire was $25 and another $50 and there must be some gage to measure the difference. He did not believe it a good thing for anyone to make an unqualified statement of guarantee, but that it would be best simply to say that if the tire was used normally, given fair usage, it would last so and so many miles.

Another bad feature of mileage guarantees is the marked tendency they have to encourage neglect on the part of the motorist, who labors under the impression that he can mishandle his tires with impunity, and get new tires practically without cost. The just claim is often turned down on account of the numerous unjust claims that are made, and it is frequently the man who has been careful and considerate who is refused adjustment when his tires do not actually give him the guaranteed mileage.

Charles L. Schwartz of the Lee Hardware Co., Salina, Kansas, expressed the opinion that tire manufacturers in the last year have been getting away more and more from mileage guarantees. Most of the large manufacturers had stopped mentioning mileage guarantee and tire service. He believed that the whole proposition was a matter of education. Not only the manufacturers, but the jobbers found that they had to teach their dealers how to educate their trade. His concern handled a great number of tires and, of course, had a large number of adjustments, but they found that a wonderful improvement was taking place in this respect. They were educating the trade to understand mileage guarantees.

F. I. Reynolds of the United States Rubber Co., New York City, addressing those who were not familiar with the question, stated that four years ago the Association of Motor Accessories Manufacturers appointed a committee to draw up a uniform guarantee with absolutely no mention of mileage. He believed that this guarantee simply guaranteed the tire to be perfect in workmanship and materials, and if any defect in workmanship or material was found the buyer or purchaser would have it made up to him by a replacement. That was briefly the meaning of the guarantee.

S. Edward Rose of Barker, Rose & Clinton Co., Elmira, N. Y., who was chairman of the meeting at which these discussions took place, said that his pride had been humbled in the past by individual manufacturers assuring him that the wholesale hardware trade took very little of their output. He wanted to know if this was true, and was assured by the manufacturers present that the comparative ratio as well as the aggregate of their hardware and automobile accessories jobbers output was important and was increasing. The manufacturers present said that hardware jobbers were undoubtedly forging ahead in the distributing of tires and automobile accessories.

Among the Tire Dealers

F. Macfarlane and H. L. Gulick of the Watsonville Cyclery have entered the supply business and opened a vulcanizing plant at 462 Main Street, Watsonville, Cal.

International Rubber Sales Co. has opened a branch at 509 Division Avenue, Grand Rapids, under the direction of F. C. Williams.

The Pacific Vulcanizing Works has moved to larger quarters in the Federal Hotel Building, Monterey, Cal.

The Gilroy Rubber Works has opened a vulcanizing plant on Monterey Street, Gilroy, Cal.

Calif & Todd have opened a Goodyear tire service station and accessory store at 1942 Van Ness Avenue, San Francisco, Cal.

A. G. Winston, owner of the Winston Auto Co., Monterey, Cal., has organized the Monterey Battery & Vulcanizing Co., to specialize on Willard batteries and United States tires.

B. L. Conrey has opened a vulcanizing and tire shop at 331 Main Street, Salinas, Cal.

Roseburg Garage, Roseburg, Ore., will be extended and a vulcanizing plant will be installed.

Pratt & Cunningham, Seattle, Wash., has been organized to take over the Kelly-Springfield Tire Sales Co., at 1528 Eleventh Avenue.

Coos Bay Vulcanizing Co., Marshfield, Ore., will move to new quarters at Anderson Street and Broadway.

Gates Tire Service, Tulsa, Okla., has removed into new quarters at Second and Detroit Streets, where vulcanizing will be done.

W. A. Schneider, Sikeston, Mo., has opened a vulcanizing shop.

The International Rubber Co. has opened a service station at Cedar Rapids, Mich.

The New England Tire & Rubber Co. has opened a store at 100 Allyn street, Hartford, Conn.

The C. & A. Garage, Pittsburgh, Kan., have enlarged their vulcanizing department.

Arthur C. Ratjen, Jefferson, Wis., has opened a tire repair and vulcanizing shop and will deal in tires and tubes.

The Paul Peters Co., Antigo, Wis., tire dealer and repairer, has taken the Goodyear and Republic tires agency in Langdale county. The service station is being equipped with new machinery.

Lee Tire & Supply Co., Grand Rapids, Mich., has moved to 30 Ionia Avenue, S. W.

The Waterloo, Iowa, agency of the International Rubber Co. for a half-sole tire service station has been secured by L. J. Lauritzen and H. B. Stuart. They have leased a building and are remodeling it.

J. R. Peelor, Hudson, N. Y., has resigned from the Hudson Auto Supply Store as a member of the firm. The business will continue to be conducted under the same name by J. C. Wood. The concern carries a full line of accessories and is distributor for Firestone tires and tubes. The store is located at 746 Warren Street.

C. M. Carlon, Curtis, Nebraska, has taken over the business of the Western Tire & Auto Co.

Work is being completed on the new machine shop for the Electric Hose & Rubber Co., Twelfth and Dure Streets, Wilmington, Del.

T. J. Mehuron has established a tire and repair shop at Beatrice, Neb.

The Paul Peters Co., Antigo, Wis., has secured the agency for Goodyear and Republic tires. The company makes a specialty of repairing tires and has recently installed new machinery in its service station.

Arthur C. Ratjen, Jefferson, Wis., has opened a tire repair and vulcanizing shop. He will also deal in tires and tubes.

The Wylund Guthrie Center Tire & Repair Co., Guthrie Center, Iowa, has been bought by E. B. Shelley.

The Plainview Rubber Co., Plainview, Tex., has bought the stock of the G. C. Electric Co.

The Luther-McCoy Motor Co., Dodge City, Kan., has bought the vulcanizing business and equipment of W. R. Archer.

News of the Tire and Accessory Manufacturers

Mansfield Employes Given Thrift Stamps—Hamilton Broadens Its Tire Business—Mason Men in Service—The Weaver Tire Spreader—Portage Prepares for Big Business

Mansfield Employes Given Thrift Stamps

Employes of the Mansfield Tire & Rubber Co., Mansfield, Ohio, were remembered at the Christmas season by a gift which combines thrift with generosity.

When the employes at the plant received their salaries and wages before the plant closed down for a four-day holiday, each employe at the plant received a card containing $5 worth of thrift stamps. There was a general meeting at which it was explained what the stamps meant and how they could be accumulated so that they would not only aid the individual in practicing thrift but also in helping the Government.

G. W. Henne, general manager of the company, recommended that the plant be shut down for a four-day period in order to give the employes a rest before starting upon the work of the new year. This is the first time in two years that the plant has been shut down, after running continuously night and day during that period.

Hamilton Broadens Tire Business

The Hamilton Rubber Manufacturing Co., Trenton, N. J., is broadening its production of automobile tires and inner tubes which are in the quality class of popular priced goods. A handsome nonskid casing has been added to the "Sable Tread" tire.

As to inner tubes, the Hamilton Company will continue the production of its "Perfection Pink" tube as well as its gray tube, and all these goods will be sold, as in the past, under the slogans, "Standard of America" and "Hamilton Made."

To facilitate its business in tires and tubes, the Hamilton Company has engaged the services of W. M. Doucette, for several years New York manager of the Portage Rubber Co., Barberton, Ohio. Mr. Doucette has a wide circle of friends in the automobile and tire trade and will now devote his energy to the development of Hamilton business in these lines.

Kreuder and Vellek Elected Directors

At a meeting of the board of directors of the Gryphon Rubber & Tire Corp., New York, held Nov. 23, William J. Kreuder and A. G. Vellek were elected directors to succeed R. M. Owen and A. E. Gordon, resigned. Mr. Kreuder was also elected vice-president and general manager.

Braender in Charge of New York Branch

Harry Braender, vice-president of the Braender Rubber & Tire Co., is now actively in charge of the company's New York branch at 250 West 54th street. In addition, he serves as district sales manager for New England and directs the export business of the company.

Keenan Goes with Pennsylvania Rubber Co.

P. C. Keenan, formerly assistant general sales manager of the Winchester Repeating Arms Co., New Haven, Conn., has been appointed manager of the Chicago branch of the Pennsylvania Rubber Co.

Henshaw Resigns

R. D. Henshaw, for ten years in charge of the New England and New York sales districts for the Michelin Tire Co., has tendered his resignation.

Weaver Tire Spreader

Repair men and owners generally experience considerable inconvenience and trouble in spreading tires so that they may repair punctures, blow-outs or other damage to either tubes or casings. The Weaver Manufacturing Co., Springfield, Ill., is now making the tire spreader, illustrated herewith, which should greatly facilitate the work of the repair man.

THE WEAVER TIRE SPREADER

By means of a foot lever, the casing is spread to the limit, thus exposing the interior to inspection. The convex plate which forms the table of the spreader is equipped with hooks, which after the casing is spread by means of the jaws, may be applied to the bead at each corner of the plate, thus holding the tire permanently spread and with a solid backing.

The casing with the plate attached may then be lifted from the spreader and carried to the buffing wheel and the break buffed to the best possible advantage. When being revolved on the spreader for inspection, the weight of the tire is carried on a nest of rollers, which are designed to protrude through the buffing plate. These rollers are suspended on a spring tension, which allows them to be pressed down flush with the face of the spreader plate as the force of the jaws is applied to the beads of the casing for spreading.

Portage Prepares for Big Business

According to G. H. Kiley, manager of the New York branch of the Portage Rubber Co., Barberton, Ohio, the company has recently contracted for billboards to extend from Chicago to Boston, along the Lincoln Highway and other important avenues of travel, as part of its recently launched advertising campaign.

Business with the Portage Co. is excellent, and in an effort to further improve its products, the company has lately developed a new cord tire which was placed on the market about the first of the new year. The new tire, of small cord construction, is cured on an inflated asbestos inner tube, which method, Mr. Kiley states, is giving highly satisfactory results. The company's well-known Daisy tread is improved upon in this tire, and is twice as deep as that used heretofore.

New Empire Directors

J. E. Baum, president of the Empire Tire & Rubber Corp., Trenton, N. J., announced that J. E. Frazer, mechanical engineer of the New York Central; W. W. Saunders, chemical expert of Akron, Ohio, and C. Edward Murray, Jr., factory superintendent, have been added to the Board of Directors of that company. The directors voted a distribution of 500 shares of capital stock to fifty-six employes as a year's bonus.

Mason Men in Service

The Mason Tire & Rubber Co., Kent, Ohio, has not been backward in supplying human material for Uncle Sam's fighting forces. The following are the names of some of the men who have joined the service:

Frank Masden, Newport, R. I., Comm. Dept., A. L. S. C.
Herbert Wright, Rainbow Division, Camp Mills, Hempstead, A. E. F., via N. Y.
Reese Harris, Co. I, Sec. A, Bldg. A-21, 332d Reg. U. S. Inf., Camp Sherman, Chillicothe, Ohio.
Lawrence Boyd, Co. M, 166th U. S. Inf., 83d Brig., 42d Div., A. E. F., via New York.
Howard Price, Camp Sheridan, Montgomery, Ala.
Edward Dyers, Co. C, 136th Mach. Gun Corps, Camp Sheridan, Montgomery, Ala.
Dudley Smith, 112th U. S. Engineers, Headquarters Camp Sheridan, Montgomery, Ala.
Frank McCray, Co. E, 332d Reg., Camp Sherman, Chillicothe, Ohio.
Robert H. Hawley, 331st Reg., Co. M, Camp Sherman, Chillicothe, Ohio.
Walter Meyers.
Leon Grabill, Co. I, Sec. A, Bldg. A-21, 332d Reg. U. S. Inf., Camp Sherman, Chillicothe, Ohio.
Clell Cannon, Co. C, 136th Machine Gun Corps, Camp Sheridan, Montgomery, Ala.
Harold Boak, Co. M, 136th Machine Gun Corps, Camp Sheridan, Montgomery, Ala.
Ivan Shanafelt, Co. M, 136th Machine Gun Corps, Camp Sheridan, Montgomery, Ala.
Leo O. Miller, Ordnance Dept., France.
F. E. Colburn.
Wesley J. Wilson.

The company recently held a flag raising with full ceremony as observed at military posts, with the entire factory and office forces present.

Mohawk Rubber Opens Branch

The Mohawk Rubber Co., Akron, Ohio, has opened a branch at 1436 Van Ness Avenue, San Francisco, Cal. George R. Cowden has been made manager. Mr. Cowden was formerly of Akron and has long been identified with the tire industry. He has been covering western territory during the past year as special representative of the Mohawk Rubber Co. Robert W. Moore of the Akron office is taking charge of the clerical work in the new office. A complete stock of Mohawk tires and tubes is being carried.

Thompson Heads Militor Sales Force

Clyde A. Thompson, formerly of the Diamond and Miller rubber companies, has been selected to head the newly organized sales and advertising forces of the Militor Corp., Marbridge Building, New York. The company is preparing to manufacture the Militor motorcycle at Elizabeth, N. J.

Fickel Mason's New York Manager

Anthony Fickel, manager of the Cleveland branch of the Mason Tire & Rubber Co., is now in charge of the company's New York branch. W. S. Steiss, who was formerly of the Akron branch, is now managing the branch at Cleveland.

Polack Branch Changes

The Polack Tyre & Rubber Co., 1876 Broadway, New York City, announces the following changes of addresses in several of its branch offices: Newark, N. J., branch, 27 Frelinghuysen Avenue; Buffalo, N. Y., branch, 1474 Main Street, G. M. Kraus, manager; Washington, D. C., service station removed to 116 C Street, N. W., office, 711 Thirteenth Street, N. W.

Auto Freight Service

In an effort to relieve the rail transportation problem, a daily freight service between Springfield, Mass., and New York is now in operation. One five-ton truck is being operated in each direction, and if successful more will be added.

Classified Buyers' Index To Rubber Factory Equipment

Below is printed an alphabetical list of the principal machinery and other equipment used in rubber factories, compiled from information supplied by the manufacturers. The key symbols placed after the items refer to the names of the manufacturers that make them, as shown in the list of Manufacturers of Rubber Factory Equipment, that is printed elsewhere on this page.

Accumulators, A11, B23, F3, T31, W31.
Autoclaves, A11, B31, D15, E11, S55.

Balances, B7, E11, S19, T27.
Bins, Stock, O3.
Blocks, Pillow, A11, F3, T43.
Blowers, Tube Splicing, G3.
Boilers, Steam, S31.
Boosters and Exhausters, A3.
Boxes, Compound, O3.
Brands, Aluminum, D19.
Brakes, T43.
Brushes, O7.
Buckets, D27.

Cages, D27.
Calenders, A11, F3, S31, T43.
Calenders, Embossing, F3, H11, T19, T43.
Cars, Shoe, O3.
Carton Filling Machines, W23.
Carton Making Machines, W23.
Castings, A11, B3, B23, B31, D27, F3, M3, T31, T43, W31.
Chemical Apparatus, B31.
Chucks, S47.
Clutches, Brake, F3, T43.
Clutches, Friction, F3.
Clutches, Magnetic, F3, T43.
Compressors, Air, S31, T31.
Condensers, D15, S55, T31.
Conveyors, D27.
Cores, Tire, A11, B3, T31, J3.
Couplings, Power, T43.
Crackers, A11, F3, T43.
Cranes, D27.
Cutters, Baby Carriage Tire, W23.
Cutters, Band, A11, E3, H31, R7.
Cutters, Bias, W23.
Cutters, Duck Plug, W23.
Cutters, Gaskets, A11, H11, H31.
Cutters, Raw Stock, W23.
Cutters, Rubber Stock, H19, H31, R7, T11.
Cutters, Scrap, A3, T11.
Cutters, Strip, E3, F3.
Cutters, Tubing, W23.

Devulcanizers, B11, D15.
Dies, A11, D19, H11, D19.
Die Sinking, A11, D19, H11.
Dies, Cutting, D19, H11.
Digestors, D15.
Dipping Machines, O3.
Doubling Machines, F3, T43.
Doubling Machines, Fabric, T17.
Drills, D27.
Drives, A11, D27, F3, T43.
Drives, Chain, D27, F3, T43.
Drives, Motor, A11, D27, F3, T43.
Drums, Bead, A11, T31.
Drums, Tire Machine, G3.
Drums, Tread, A11.
Dryers, A35, B31, D15, H27, S31, S55.
Dryers, Fabric, C51, D15, T19, T43.
Dryers, Rubber, D15.
Dryers, Vacuum, D15, S55.
Dynamometers, S19.

Engines, Steam, S31.
Engraving Machines, Hard Rubber, A11.
Experimental Outfits, A11, B3, D15, D19, E11, F3, T43.
Extractors, E11.

Fittings, Hydraulic, A11, B23.
Fittings, Water, A11.
Folders, Belt, F3.
Forms, Dipping, D19.

Gages, Pressure, B23, S7.
Gages, Recording, S7.
Gages, Thickness, H11.
Gears, A11, F3, M23, T43.
Governors, Pump, M15.
Grinders, A11, F3, S47, T43.
Grinders, Hard Rubber Dust, A3, A11, F3, R3, T43.

Hammers, Steam, B31.
Hangars, D27, M27.
Hoists, D27.
Holders, Form, O3.
Hooks, Tire, D27.
Hose Machines, F3, R27.
Hydraulic Machinery, A11, B23, F3, H19, T43, W31.
Hydrometers, T7, T27.

Ice Machines and Equipment, D27.
Impregnators, B31, D15, F3, S55.
Instruments, Recording, S7, S19.
Insulating Machines, R27.

Joints, Expansion, A11, B23.
Kettles, A11, B31, D7, D15, S31, S55.
Knives, H31, J7, R7, T43.
Knives, Calender, R7.
Knives, Jar Ring, R7.
Knives, Mill, R7.
Knives, Tapping, R7.
Laboratory Apparatus, D7, D15, E11, F3, R27, S15, S19, T27.
Ladders, Rolling, M27.
Lathes, Hard Rubber, A11, S47.
Lathes, Jar Ring, A11, T31, W23.
Lathes, Wrapping, A11.
Lockers, O3.
Looms, Hose, R27.

Magnets, D23.
Mandrels, A11.
Markers, Shoe, H11.
Microscopes, E11, T27.
Mills, Grinding, A3, A11, E11, F3, R3, D7, T43.
Mills, Mixing, A11, D7, F3, T43, W7.
Mills, Paint, D7, R3.
Mills, Washing, A11, F3, T43, W7.
Mixers, Solution, D7, W7.
Molds, Hose, A11.
Molds, Mechanical, A11, D19, H11, H19, M3, T15, J3, D19.
Molds, Sole and Heel, D19, J3, D19.
Molds, Sundries, D19, H11, J3, D19.
Molds, Syringe Bag, D19, J3, D19.
Molds, Tire, A11, B3, T31, J3, D19.
Molds, Toy, D19, J3, D19.
Molds, Water Bottle, D19, J3, D19.
Motors, D27, E11, T43.

Name Plates, H11.

Pattern Making, A11, M3, T43.
Percolators, D7, D15, E11, S55.
Plaiters, W23.
Plantation Machinery, F3, T43.
Plants, Aniline Oil, D15.
Presses, Baling, B23.
Presses, Bead, A11, B23, F3, W31.
Presses, Belting, A11, B23, F3, T43, W31.
Presses, Blocking, B23.
Presses, Filter, A3.
Presses, Forcing, A11, B23, T43, W31.
Presses, Hand, A11, B23, E11, F3, H19.
Presses, Heater, A11, B11, F3, W31.
Presses, Hydraulic, A11, B23, F3, H19, T19, T31, T43, W31.
Presses, Plate, A11, B23, F3, W31.
Presses, Sheeting, A11, B23, F3.
Presses, Shoddy, A35.
Presses, Tire Setting, A11, B23, W31.
Presses, Vulcanizing, A11, B11, B23, F3, T31, W31.
Pulverizers, A3, D7, E11, R3.
Pumps, A3, A11, E11, M27, S31, T31.
Pumps, Centrifugal, T31, W31.
Pumps, Hydraulic Pressure, A11, B23, S31, T31.
Pumps, Spray, M27.
Pumps, Vacuum, A3, B31, D15, E11, S31, S55, T31.

Racks, Drying, D7, D27.
Racks, Shoe Car, H11, O3.
Racks, Tire, D7, D27, O3.
Railways, Industrial, D27.
Reclaiming Machinery, B11, D7, F3, R27, S55, T43.
Refiners, A11, F3, T43.
Regulators, Damper, M15.
Regulators, Pressure, D3, M15, T7.
Regulators, Pump, M15.
Repair Equipment, Tire, B11.
Riveters, W31.
Rollers, Hand, B3, H11, H19.
Rollers, Strip, B3.
Rolls, A11, F3, T43.
Rolls, Chilled, A11, T43.
Rolls, Cooler, F3.
Rolls, Engraved, F3, H11.
Rolls, Mill, A11, F3, T43.
Rolls, Sand, A11, F3, T43.
Rolls, Steel, F3.
Rolls, Wood, G3.
Safety Appliances, D27, F3.
Scales, B7, D27.
Screens, D7, O3.
Screw-Downs, Calender, A11, T43.
Separators, Air, R3.
Separators, Magnetic, D23.
Separators, Water, A35.
Shafting, A11, D27, F3, T43.
Shears, Hand, J7.
Shears, Power, F3.
Shells, Belting, G3, C55.
Shells, Calender, C55, O3
Shells, Stock, G3, C55.
Sifters, D7.
Sifters, Brush, D7.
Slitting Machines, F3.
Skivers, J7, R7.
Solvent Recovery Apparatus, B31, D15, S55.
Special Machinery, J3.
Spreaders, A11, F3, T43.
Sprockets, D27, M23, T43.
Stamps, Steel, D19, H11, D19.
Stands, Tire, A11, B3, T31.
Starters, Motor, T43.
Sticks, Shoe, H11, O3.
Stitchers, B3, H11.
Stops, Safety, D3, D27, F3, T43.
Strainers, A11, R27.
Stretchers, Belt, A11, F3, T19, T43.
Stretchers, Hydraulic, A11, F3, T43.
Switches, Electrical, D27, T43.

Tables, Calender, O3.
Tables, Cooling, D27, O3.
Tables, Tire Conveying, O3.
Tanks, Acid, B11, D15, S55, T19.
Tanks, Soaking, B11, S55, T31.
Testing Machines, B11, S19.
Thermometers, E11, S7, T7, T27.
Tire Making Machines, B3, R27, T31.
Tire Tread Machines, R27.
Tire Wrapping Machines, Cloth, T15, T31, T43.
Tools, Fountain Pen, S47.
Tools, Rubber Workers', H11, H31.
Tramways, Overhead, D27, O3.
Transmissions, A11, D27, M23, T43.
Traps, Steam, D3.
Trimmers, W23.
Trolleys, D27.
Trucks, Industrial, D7, D27.
Tube Wrapping Machines, A11, T43.
Tubing Machines, A11, R27.

Valves, Float, M15.
Valves, Hydraulic, B23, D27, T31, W31.
Valves, Reducing, D3, D27, M15.
Vulcanizers, A11, B11, D15, T31, W31.

Washers, A11, D15, F3, T43.
Washers, Beater, T43.
Washers, Tub, D7, F3, T43.
Wheels, Buffing, O7.
Wheels, Roller Bearing, D27.
Wire Drawing Machines, T43.
Wiring Machine, Hose, A11.
Wrapping Machines, A11, T15, T31.

Manufacturers of Rubber Factory Equipment

THE RUBBER AGE AND TIRE NEWS will gladly supply information regarding the addresses and products of the following manufacturers of Rubber Factory Equipment.
The advertisements of concerns whose names appear in bold face type will be found in this issue of THE RUBBER AGE AND TIRE NEWS.

A 3—Abbe Engineering Co.
A 7—Adams, John J.
A 11—Adamson Machine Co.
A 15—Adamson Mfg. Co.
A 19—Air Utilities Co., Inc.
A 23—Akron Rubber Mold & Machine Co.
A 27—Allen Machinery Co.
A 31—Alvey-Ferguson Co.
A 35—American Process Co.
A 39—American Rotary Valve Co.
A 43—American Tool & Machine Co.
A 47—Arthur Vulvanizing Machine Co.
B 3—Banner Machinery Co.
B 7—Becker, Christian, Inc.
B 11—Biggs Boiler Works Co. See Advertisement on Page 363.
B 15 — Birmingham Iron Foundry. See Advertisement on Page 345.
B 19—Bonnett Co.
B 23—Boomer and Boschert Press Co. See Advertisement on Page 359.
B 27—Bristol Co.
B 31—Buffalo Foundry & Machine Co.
C 3—Cameron Machine Co. See Advertisement on Page 349.
C 7—Cell Drier Machine Co.
C 11—Champion Shoe Machine Co.
C 15—Chernack Mfg. Co.
C 19—Chicago Mold & Machinery Co.
C 23—Edred W. Clark.
C 27—Colonial Sign & Insulator Co.
C 31—Continental Rubber Works.
C 35—Cox, Geo. P., Last Co.
C 39—Crane Co.
C 43—Curtis & Marble Machine Co.
C 47—Cutler-Hammer Clutch Co.
C 51—Cutter, G. A., Sales Agent.
C 55—Cylinder Mfg. Co.
D 3—Davis, G. M., Regulator Co.
D 7—Day, J. H., Co.
D 11—De Mattia Bros.
D 15—Devine, J. P., Co.
D 19—Die Sinking & Machine Co.
D 23—Dings Magnetic Separator Co.
D 27—Duncan, J., Co.
E 3—Eastman Machine Co.
E 7—Eggers, William, & Sons.
E 11—Elmer & Amend.
E 15—Esterline Co.
F 3—Farrel Foundry & Machine Co. See Advertisement on Page 348.
F 7—Ford Chain Block & Mfg. Co.
G 3—Gammeter, W. F. See Advertisement on Page 359.
G 7—Garvin Machine Co.
G 11—General Electric Co.
G 15—Goodnow, L. H., Foundry Co.
H 3—Hartford Special Machinery Co.
H 7—Haywood Tire & Equipment Co.
H 11—Hoggson & Pettis Mfg. Co. See Advertisement on Page 360.
H 15—Hollander & Johnson.
H 19—Holmes Bros.
H 23—Housatonic Machine & Tool Co. See Advertisement on Page 362.
H 27—Hunter Dry Kiln Co. See Advertisement on Page 358.
H 31—Hyde Manufacturing Co. See Advertisement on Page 360.
J 3—Jones & Kuhlke. See Advertisement on Page 362.
J 7—Judson Cutlery Co. See Advertisement on Page 358.
K 3—Knott, L. E., Apparatus Co.
K 7—Kohl Mfg. Co.
L 3—Lander Last Co.
L 7—Landis Machine Co.
L 11—Lenz & Naumann.
L 15—Link Belt Co.
L 19—Lloyd, John, Co.
L 23—Lobdell Car Wheel Co.

Manufacturers of Rubber Factory Equipment—Continued

M 3—McFarland Foundry & Machine Co.
M 7—McGrory, Philip.
M 11—Mahlow & Wykoff.
M 15—Mason Regulator Co.
M 19—Miller, Chas. E.
M 23—Morse Chain Co.
M 27—Myers, F. E., & Bro.
N 3—New England Butt Co.
N 7—Norton, M., & Co.
O 3—Ornamental Iron Works Co.
O 7—Osborn Mfg. Co.
P 3—Pierce Wrapping Machine Co.
R 3—Raymond Bros., Impact Pulverizer Co.
R 7—Richard Co., Inc., Stephen.
R 11—Riehle Bros., Testing Machine Co.
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R 23—Rossman, Roy G.
R 27—Royle, John, & Son.
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S 43—Smith-Backmann Machine Co.
S 47—Smith Co., James M.
S 51—Southwark Foundry & Machine Co.
S 55—Stokes, F. J., Machine Co.
S 59—Summit China Co.
T 3—Tagliabue Mfg. Co.
T 7—Taylor Instrument Co.
T 11—Taylor, Stiles & Co.
T 15—Terkelsen & Wennberg.
T 19—Textile Finishing Machine Co. See Advertisement on Page 361
T 23—Textile Machine Co.
T 27—Thomas Co., Arthur H.
T 31—Thropp's, John E., Sons Co.
T 35—Trefethen, F. L.
T 39—Troemner, Henry.
T 43—Turner, Vaughn & Taylor Co. See Advertisement on Page 364
U 3—Utility Mfg. Co.
V 3—Venn, Frank.
W 7—Werner & Pfleiderer Co.
W 11—Westinghouse Electric Mfg. Co.
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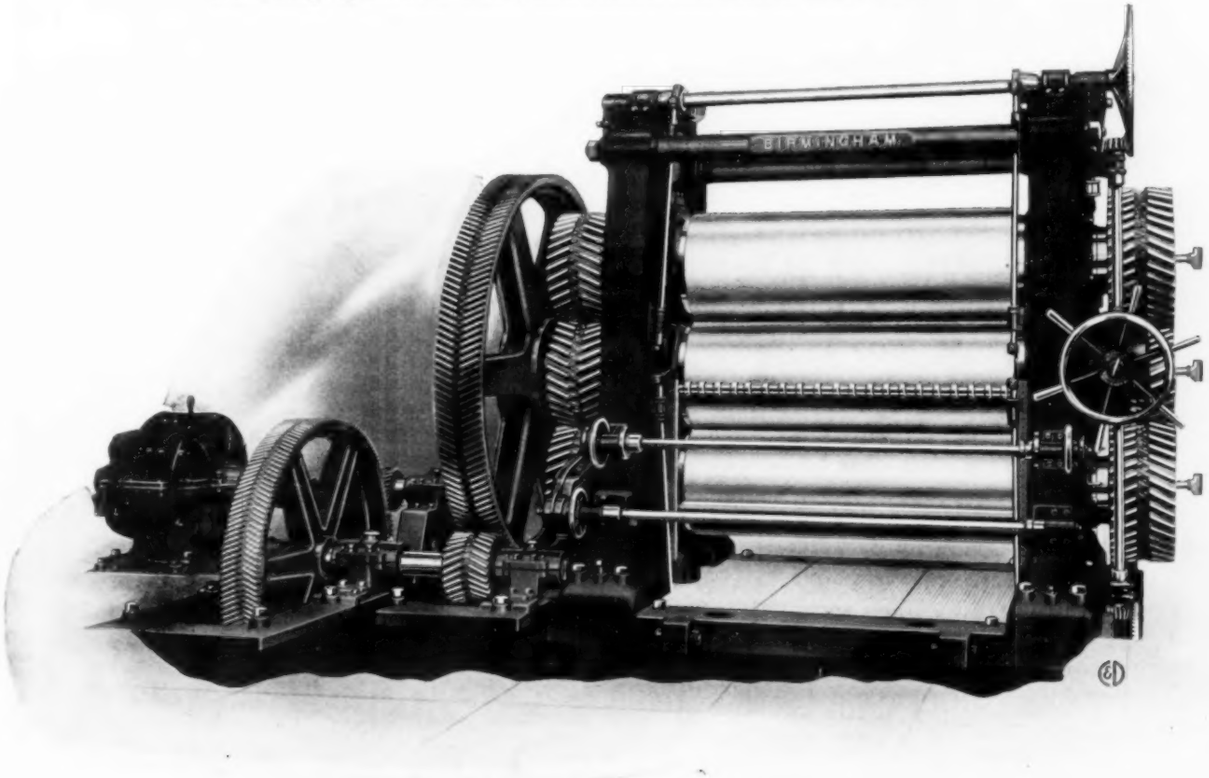

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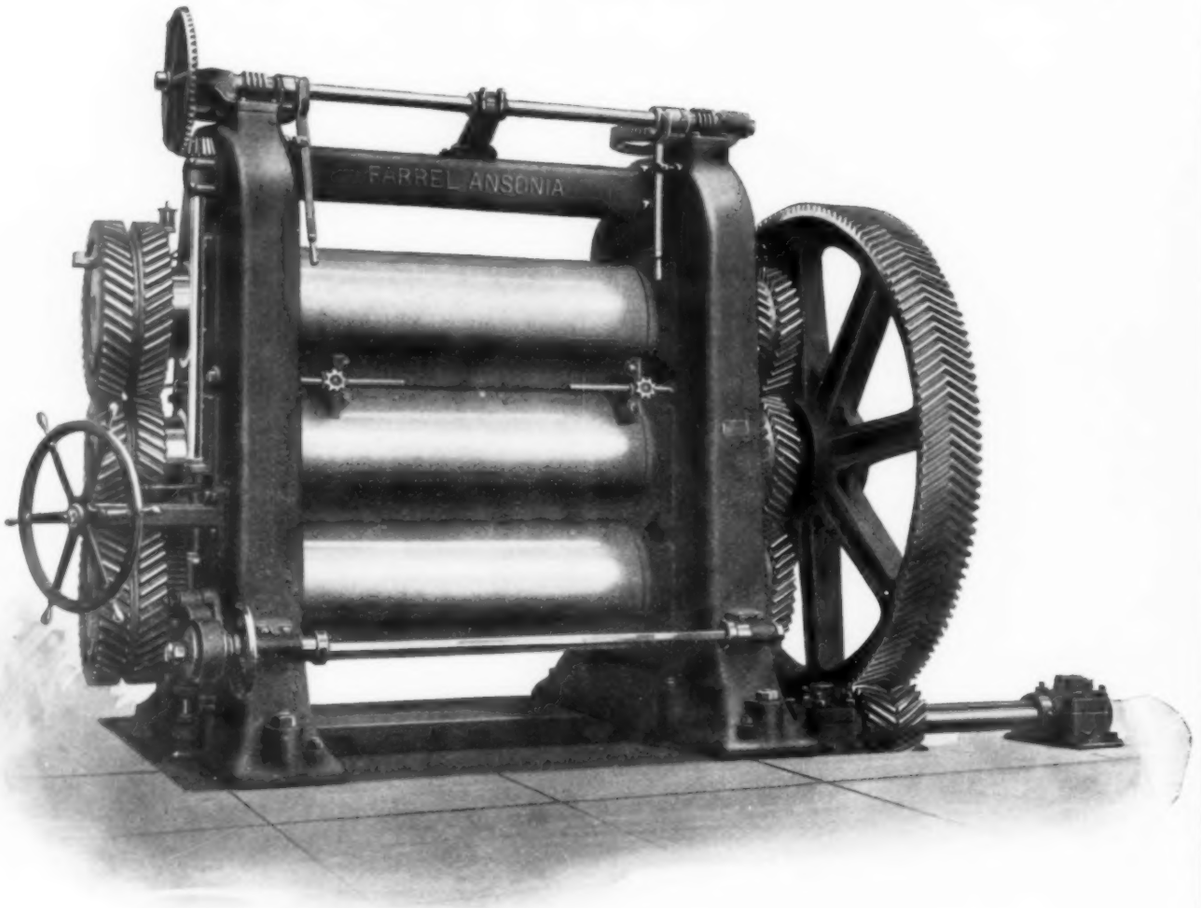

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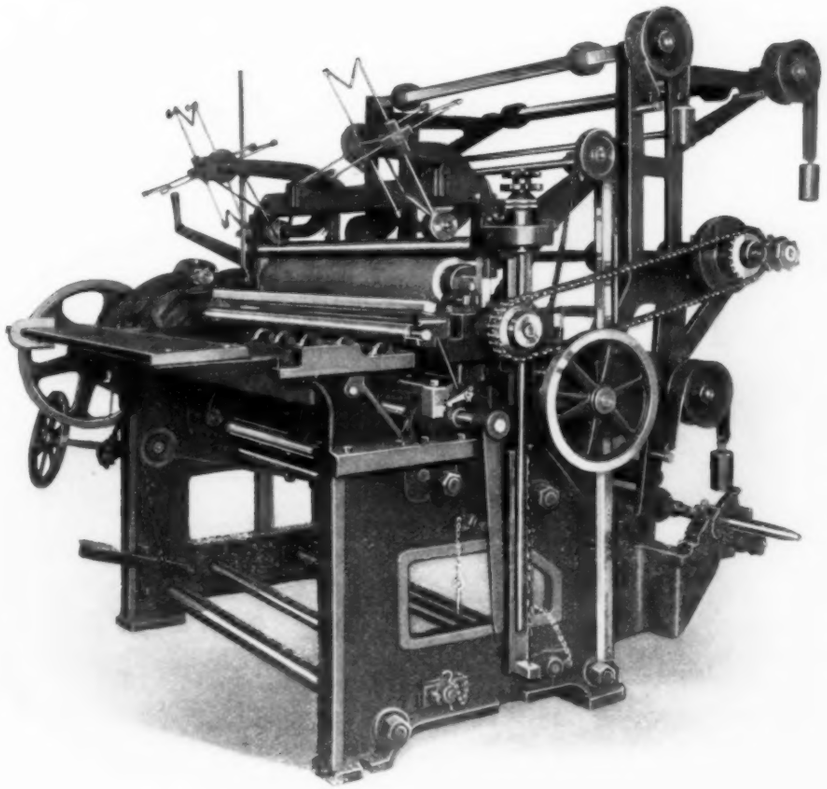

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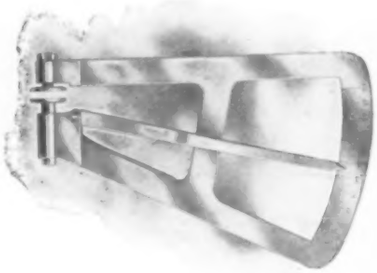

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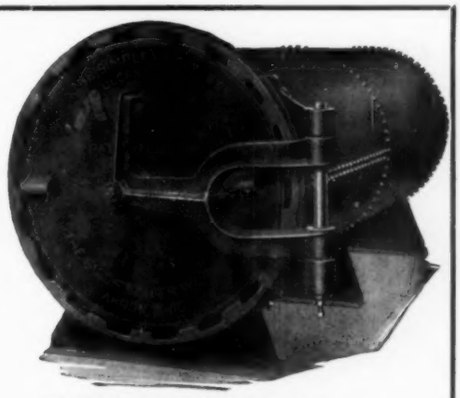

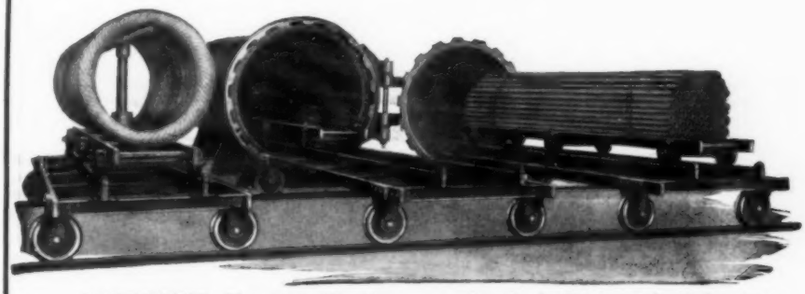

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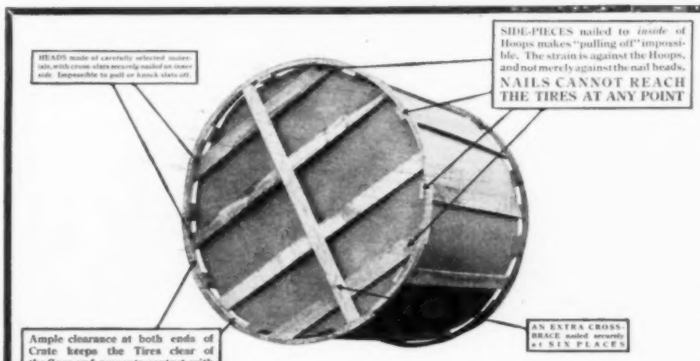
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MR. HOOVER and his helpers are preaching a live idea, and we're with them to the finish—heart and soul, just as you are.

But we've been helping you put across that very idea in the rubber business for years; and now that the reduction of every sort of waste is a national virtue, it's good to remember that *your* start was made long ago.

You Are Conserving "Men and Materials" in These Real Ways When You Ship Your Tires in Steele-Alderfer Tire Crates:—

MEN—Packing in Steele-Alderfer Crates can be done with a smaller force than possible with other methods—a big object when short of help.

MEN—Time—The "swing" of putting up tires in Steele-Alderfer Crates is quickly learned; men make better speed than when using bulkier or more cumbersome packages.

MATERIALS — Money — Tires in Steele-Alderfer Crates take a lower freight rate than when shipped loose, or in other kinds of packages. Don't overlook the economy.

MATERIALS — Space Occupied — Steele-Alderfer Crates hold more tires than packages of other form of same cubic contents—owing to their cylindrical shape and compact construction.

MATERIALS—Tires packed in Steele-Alderfer Crates are protected against every ordinary injury. Damage claims vastly reduced.

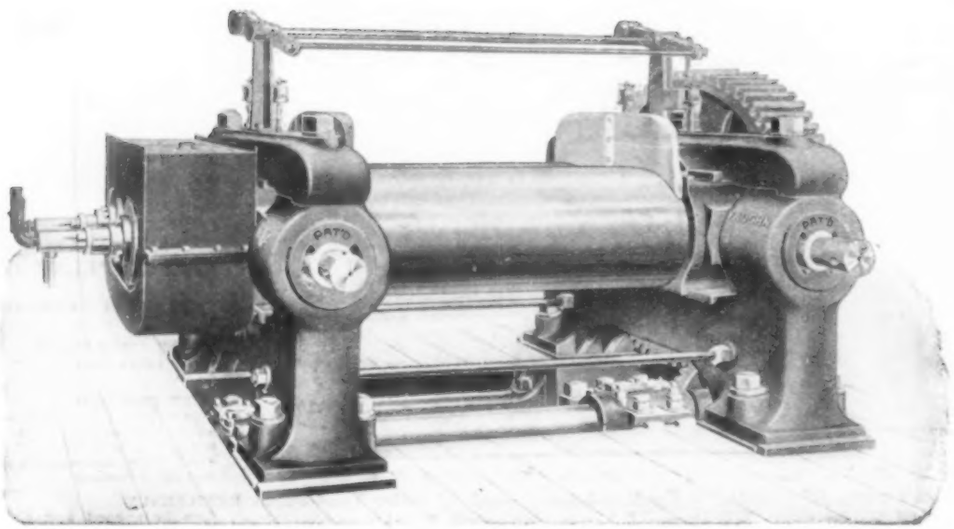
MATERIALS—Tires in Steele-Alderfer Crates held clear of floor and protected against contact at sides; danger of damage in storage thus greatly lessened.

Better get particulars now. We have important things to tell you—about *your* business as well as ours. No obligation in asking for them.

THE STEELE-ALDERFER COMPANY, Cuyahoga Falls, Ohio *Near Akron*

Makers of Automobile Tire Crates, Hose Reels, Hose Cores, Carriage Tire Reels and Other Containers for Shipping Rubber Products. "If We Haven't a Package Suited to Shipping Your Product, We'll Make One for You."

THE WILLIAMS PRINTING COMPANY, NEW YORK



VAUGHN MACHINERY

Located at the very heart of the rubber industry, our Engineers are in constant touch with the world's largest producers of rubber goods of every description, which gives them first hand knowledge of the requirements of present day practice.

Safe--Economical--Efficient

THE TURNER, VAUGHN & TAYLOR CO.

Cuyahoga Falls, Ohio